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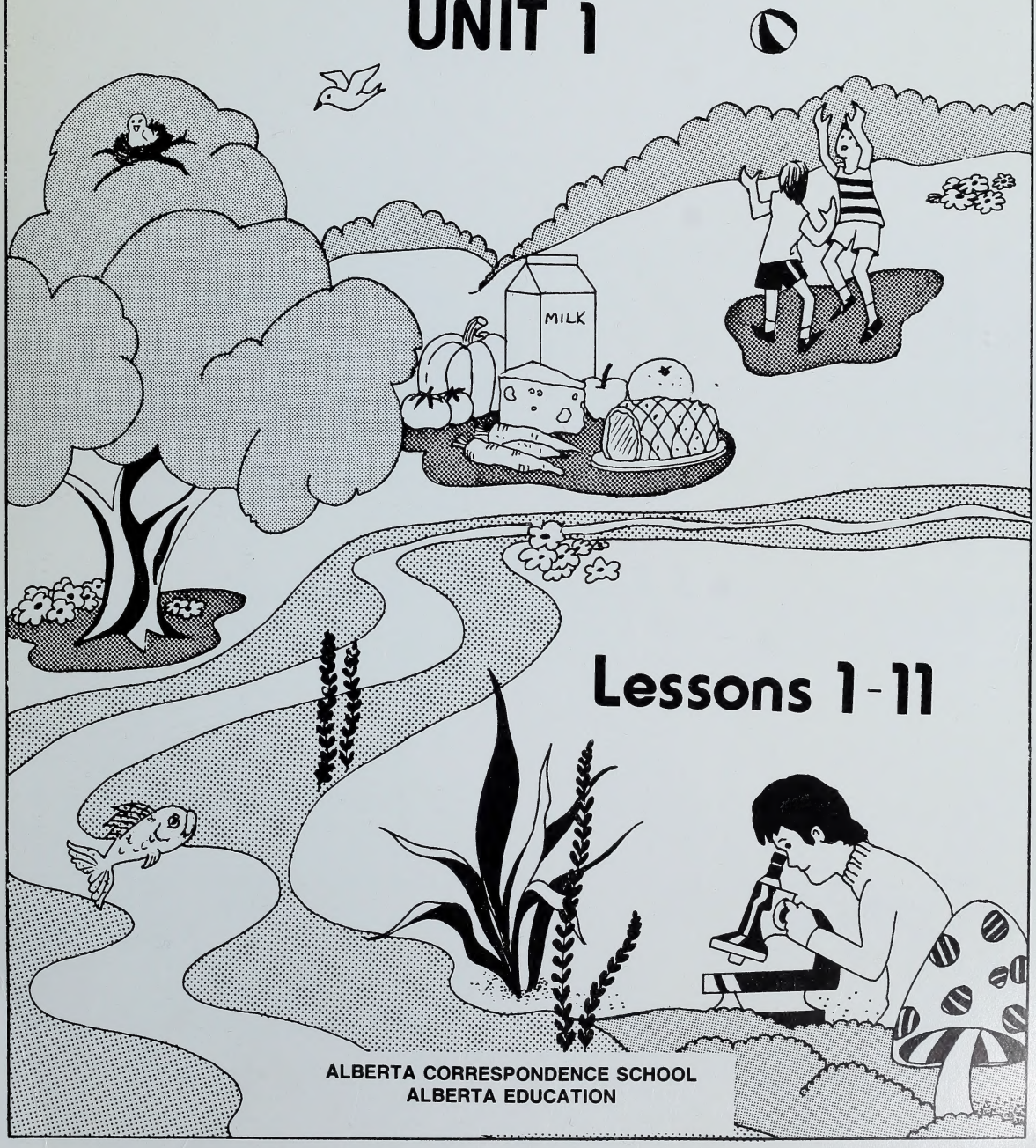
GRADE 6 SCIENCE

UNIT 1



Lessons 1-11

ALBERTA CORRESPONDENCE SCHOOL
ALBERTA EDUCATION

Science 6

Unit 1

LESSONS 1-11

Distance Learning

Alberta EDUCATION

Science 6
Student Module
Unit 1
Lessons 1-11
Alberta Correspondence School
ISBN No. 0-7741-0158-X

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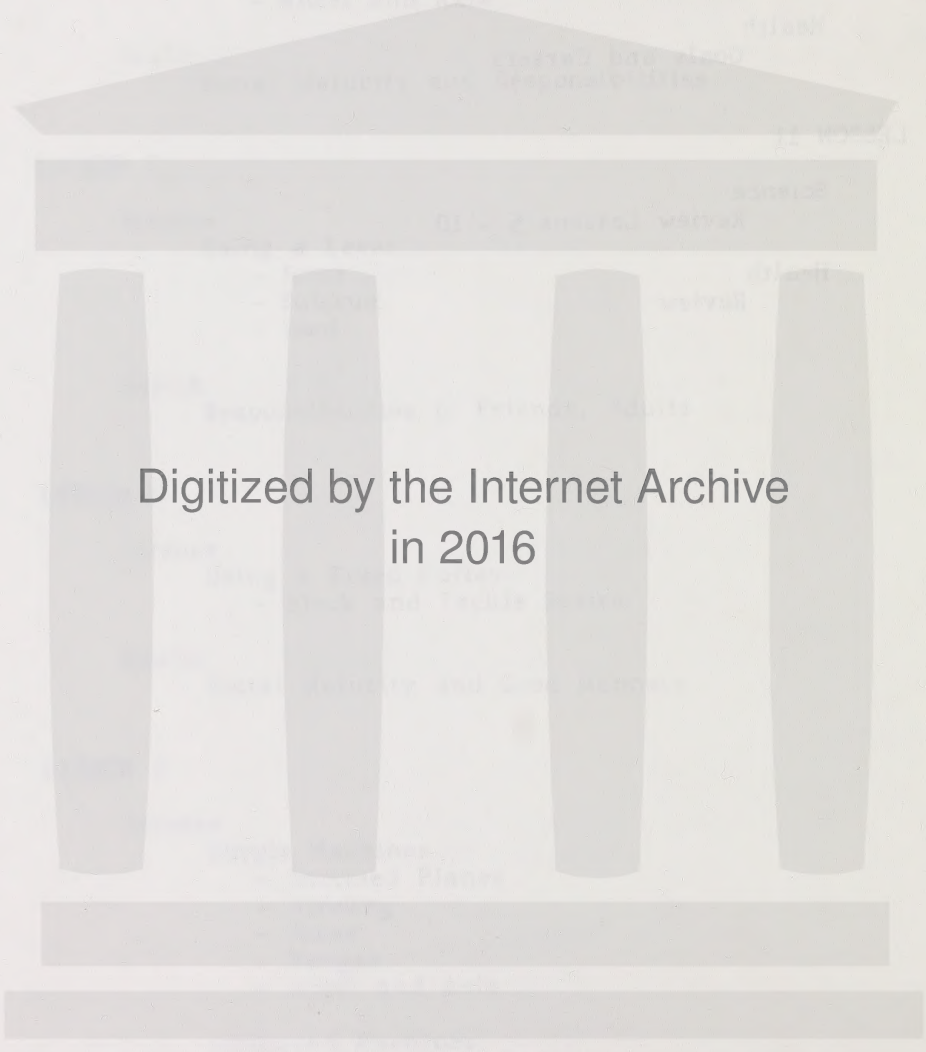

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A Lesson Record form with the **correct** label attached **must** be enclosed with **every lesson** submitted for correction, as illustrated below.

Correct use of these labels will ensure prompt processing and grading of your lessons.

The enclosed **Lesson Labels** must be checked for spelling and address details.

Please advise the Alberta Correspondence School promptly of any changes in name, address, school, or any other details and we will issue a revised set of labels. Your file number is permanently assigned and **must** be included on all correspondence with the Alberta Correspondence School. If the proper label and Lesson Record Form is not attached to each lesson as indicated it will delay your lessons being processed and credited to you.

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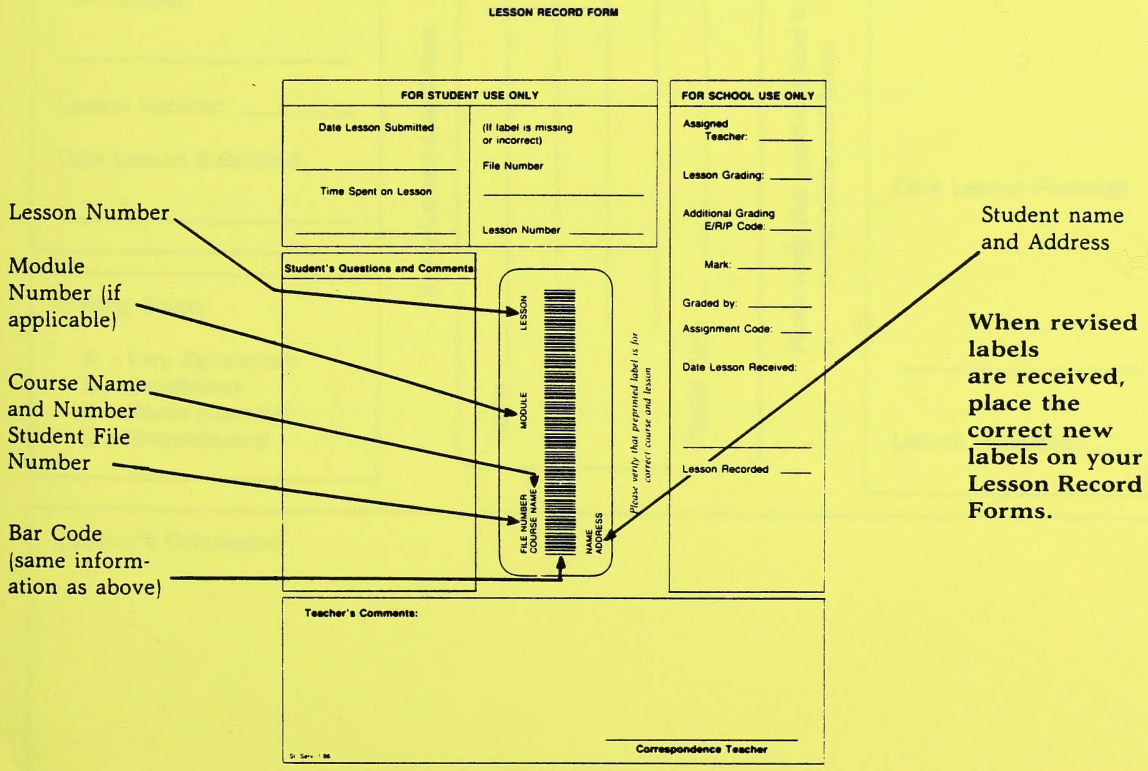

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LESSON RECORD FORM

0604 Science

Revised 90/04

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Lesson Number: _____

Date Lesson Submitted:

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B - Satisfactory
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Lesson Grading

Science: _____

Health: _____

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ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

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(1) All pages are numbered and in order, and no paper clips or staples are used.
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Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

To begin your study in Grade 6 Science you will look into the subject of learning. How do you learn? When you were born you could not say a word. Until you started school you couldn't write very much – perhaps only your name. You, and all other human beings, are able to use language. Were you born with this ability? Language is a way of passing on what you have learned so that someone else can get along better or help you to learn more.

FIRST DAY

Think of all the things you do during the day, and list them in two columns. One column shows the abilities you were born with, and the other column shows the abilities you had to learn.

Abilities I was born with	Abilities I had to learn

Your list should tell you that most of the things you do had to be learned. But how did you learn to do them? How do you think you have been able to learn all you know in 11 or 12 years? Write your ideas on the lines below.

SEND FOR CORRECTION

There certainly are some things we can do without learning or without thinking. Let's look more closely at the kinds of actions we do without thinking.

PROBLEM: To find if blinking is an action we do without learning

MATERIALS: a partner, or your supervisor, a square of cellophane and about six sheets of paper

PROCEDURE: Crumple the six sheets of paper into six paper balls. Place five where your partner cannot see them and keep one in your hand.

Ask your partner to hold the piece of cellophane in front of his or her eyes, and to look straight at you. Throw the paper ball *GENTLY* against the sheet of cellophane. Does your partner blink?

Ask your partner to try very hard to keep his eyes open and not to blink, as you throw several more paper balls. Can he do it?

Now exchange and have your partner throw balls at you. Try to control your own blinking. Can you?

RESULTS: Were you or your partner able to control your blinking? _____ What happened to your eyes each time the paper was tossed at the cellophane?

_____

_____

_____

_____

_____

_____

CONCLUSION: Did you have to learn how to blink or is blinking an act that can be performed without learning?

Blinking is an action you can do without learning. Such actions which can be done without learning are called *reflex acts*. To find more examples of reflex acts read:

Concepts in Science 6, Perfect - Without Learning, Page 4

Reflex acts are *INBORN* or *UNLEARNED ACTS*. They are part of your *BEHAVIOR* from the time you are born. You do them quite well without learning. Some examples of reflex acts are: *sneezing and coughing.*

Think about the things you do well which you did not have to learn to do.

List four other reflex acts.

Remember: *REFLEX ACTS* are *INBORN* or *UNLEARNED ACTS.*

SEND FOR CORRECTION

SECOND DAY

Last day we studied reflex acts which are acts we can do without learning. Examples of reflex acts are sneezing, coughing and blinking.

Animals also perform inborn acts. For example, if you gently stroke the tip of the ear of a sleeping cat, the ear will twitch. The twitching ear is an unlearned or reflex act – an act done without learning.

Nest-building is an inborn act for birds. However, nest-building is not just a simple reflex act like blinking or twitching an ear. Why is nest-building not just a simple reflex act? Read:

Concepts in Science 6
FIRST EDITION
Inborn Acts in Animals
Pages 6 - 7

or

Concepts in Science 6
SECOND EDITION
Not-So Simple Reflex Acts
Pages 6 - 7

1. In your own words tell why nest-building is not just a simple reflex act.

SEND FOR CORRECTION

Nest-building is an inborn act. This means it is done without learning. However, nest-building is more than just a simple reflex act like blinking. To build a nest, a bird performs many different acts. Nest-building is not simple, but a lot of *COMPLEX REFLEX ACTS*. This means there is more than one step to nest-building and each step is quite difficult.

Another word that is used for a lot of complex reflex acts is the word *INSTINCT*.

	INSTINCT or COMPLEX REFLEX ACTS	SIMPLE REFLEX ACTS
Difference:	several difficult steps	one simple step
Similarity:	done without learning	done without learning
Example:	nest-building	blinking

2. Give two other examples of a complex reflex act.

_____

_____

_____

_____

Remember: *COMPLEX REFLEX ACTS* are *INBORN* or *UNLEARNED*.

SEND FOR CORRECTION

Each nest and spider web below is an example of a complex reflex act. This means that the building and spinning of these nests and webs is an inborn or unlearned act. Making the nests and webs involved a number of difficult steps. Notice that each nest and each web is different. We can identify the bird and spider by their different nests and webs. Each bird and spider has an instinct to build a certain kind of nest or web.

THIRD DAY

Reflex acts are inborn actions. We do not have to learn how to do them. When someone unexpectedly throws something at you, you blink. When you eat something, your stomach digests it. You didn't learn to blink or digest your food. Do you think about blinking or digesting your food before you do either one? _____ No, because reflex acts, simple and complex, need no learning and require no thinking.

Simple and Complex Reflex Acts

- no learning, inborn behavior

Let's find out more about reflex acts which we say are inborn or instinctive behaviors. A reflex act involves a *STIMULUS* and *RESPONSE* . What is a stimulus and a response? How are stimulus, response and reflex acts related? Read:

Concepts in Science 6
FIRST EDITION
Inside the Body ("Message" Relays)
Pages 7 - 9

Concepts in Science 6
SECOND EDITION
Darts and Messages
Pages 8 - 9

In your own words, explain what a stimulus and a response are.

_____

_____

_____

_____

_____

_____

_____

_____

One boy when asked what a stimulus and response were said:

> A stimulus is what someone does when he "bugs" me.
>
> A response is what I do to the person who "bugged" me.

This fellow was on the right track.

A STIMULUS is whatever makes us do something.
The RESPONSE is our action or the thing we do because of the stimulus.

A simple or complex reflex act consists of a stimulus and a response. *(In a simple or complex reflex act your response, or the thing you do, is unlearned.)*

Example: Blinking - a simple reflex act

Stimulus - paper ball thrown at you

Response - blinking

The stimulus in a simple reflex act is fairly easy to identify.

Example: Digestion - a simple reflex act

Stimulus - food entering the stomach

Response - food is digested

In complex reflex acts or in instinctive kinds of behavior, the stimulus is not always as easy to identify.

Example: Ducks and geese flying south — a complex reflex act or something done because of instinct.

Stimulus — Much study has gone into trying to find out what stimulates the ducks and geese to fly south. Some ideas are:

- change in air temperature
- shorter days meaning less light

Response — Even though the stimulus is in question, the response is to fly south for the winter.

In your science text you read about a simple reflex act in the hydra. You found that the stimulus in a reflex act is sometimes called a message. The message or stimulus must be carried to parts of the body of the hydra before a response is made.

The Reflex Act in a Hydra

Stimulus or Message	- Some tiny animal brushes against a tentacle.
Nerve Impulse	- The message of a stimulus is relayed or sent throughout the body by way of the nerve net. The nerve net is made of nerve fibres.
Response	- Muscle cells get the message and respond by pulling the tiny animal into the hydra's body.

Below are listed stimuli for simple reflex acts. Tell how you usually respond. Remember that your response to the stimuli is unlearned.

Stimulus	Response
- being touched with icy cold fingers	
- a loud sound in the middle of the night	
- someone behind you saying "boo"	
- food entering the stomach	

SEND FOR CORRECTION

Stimulus	Response
- eating something very sour	_____
	_____
	_____
	_____
- bright light suddenly coming on in a dark room	_____
	_____
	_____
	_____

Listed below are examples of reflex acts. Identify the stimulus and the response in each.

1. If you brush the pads of a dog's hind paws when the dog is asleep, the paw will jerk away.

Stimulus	Response
_____	_____
_____	_____
_____	_____

2. If you tickle someone's foot, the person may jerk his foot away quickly.

Stimulus	Response
_____	_____
_____	_____
_____	_____

SEND FOR CORRECTION

3. If your food goes down the wrong channel, when you swallow, you begin to cough.

Stimulus	Response
_____	_____
_____	_____
_____	_____

FOURTH DAY

To begin your study of How We learn, you have been reading about things we can do without learning. Things we do without learning are called *REFLEX ACTS*.

Reflex acts can be *SIMPLE* or *COMPLEX*. Blinking is an example of a simple reflex act. Birds building nests is an example of complex reflex acts. Complex reflex acts are sometimes called *BEHAVIORS*.

Complex and simple reflex acts consist of a *STIMULUS* and *RESPONSE*. A stimulus makes us act in certain ways. The way in which we act is called a response.

> IN SIMPLE OR COMPLEX REFLEX ACTS THE RESPONSE IS ALWAYS UNLEARNED.

With these ideas in mind, complete the following questions. You may use your notes and your text to check on any ideas you are not certain about. Circle your answers.

A. 1. An example of an unlearned act is

a) blinking. b) tying a shoelace.

2. An unlearned or reflex act is

a) inborn. b) developed after birth.

3. The beating of the heart is a

a) learned act. b) reflex act.

4. Nest-building is

   a) an unlearned act. b) a learned act.

5. Nest-building is different from blinking in that it is a

   a) simple reflex act. b) complex reflex act.

6. In white rats, caring for the young is

   a) a simple reflex act. b) an instinct.

7. Nerve impulses in the hydra are carried by a

   a) nerve net. b) stimulus.

8. A stimulus brings forth

   a) another stimulus. b) a response.

9. A nerve impulse is carried along the nerve. The type of impulse, whether electrical or chemical, is

   a) unknown. b) known.

10. The science that is concerned with the way living things behave is called

    a) psychology. b) physics.

SEND FOR CORRECTION

B. Peter's father was an excellent tennis player. In time, Peter came to be captain of his school's tennis team.

The neighbors used to say, "Peter is a born tennis player. After all, like father, like son."

Is tennis-playing an inborn act? What is your reasoning?

SEND FOR CORRECTION

FIFTH DAY

Health

What do you do to stay healthy?

Each week on the Fifth Day, instead of doing science activities, you will be discovering that your daily activities at home, school and in the community help to make you the special person that you are. As you grow and develop, you will learn that your health depends on the actions you take. If you take healthful actions, your health will be good. If you take unhealthful actions or neglect healthful actions your health will suffer.

Let's look at some of the things you might do each day.
Read each item.
Check the column that you think rates the way you feel about the development of a good health program.

I believe I should	Very Important	Important	Fairly Important	Not Important
Eat three meals a day				
Have breakfast each morning				
Eat bacon and eggs for breakfast				
Be happy all of the time				
Like everyone				
Have teeth checked by a dentist twice a year				
Enjoy simple pleasures, like food and nature				
Never snack between meals				
Accept disappointments calmly				
Show love of other people				
Trust my friends				
Feel responsible for other people				

I believe I should	Very Important	Important	Fairly Important	Not Important
Share my cassette radio with my friends				
Share household duties with my family				
Be able to laugh at myself when I am wrong				
Be able to admit when I am wrong				
Be glad that I am the biggest person in my family				
Face problems and try to solve them				
Respect the differences I see in others				
Stand up for my beliefs				
Scream and yell when I am angry				
Not push others around				

Discuss this checklist with your supervisor. Here are some ideas which will help you decide which actions are more important than others.

Many of the statements in the checklist are very important and it is wise to observe them in order that you grow in a healthy way. I am certain that you all agree that visiting your dentist twice a year is very important. Sharing responsibilities with your family members is very important to help you develop into a very special person.

The following discussions are ways you can interpret some of the other statements.

Eat three meals a day - Children need to eat sufficient food for good nutrition, but it does not have to be three meals. It is believed that four or five small meals a day is better for a person's digestive system.

Have breakfast each morning and bacon and eggs for breakfast - Having a nutritious breakfast each morning is important, but bacon and eggs are not necessarily most important. There are many other nutritious breakfast foods.

Be happy all the time - This may seem important, but really is not that important. Even the best adjusted person cannot be happy all the time. Everyone has periods of being happy, sad or angry at some time in his life.

Like yourself - This is very important — Remember you are a special person. You can change your actions to become a better person.

Never snack between meals. - Not very important — These days the idea is that snacks can be useful in providing growing youngsters with energy.

Feel responsible for other people - Fairly important, but children should realize that there comes a point beyond which you cannot help a person, so you should not feel guilty about this.

Be glad that you are the biggest person in the room	Not important — The biggest person may not be the healthiest. In fact he may not be healthy at all. Size has little to do with a person's health.

After the discussion, hang your checklist on a wall near your study area, or keep it with your corrected lessons. You will be asked to discuss the same statements later in the year. From the checklist you will be able to determine what you have done to grow healthy mentally, physically and socially.

1. Use your chart to determine the following. Give your answers in complete sentences. Remember that there are really no right or wrong answers. The responses you give will be exactly what you think.

   (a) In what ways do you think you are growing up physically, mentally and socially.

   _____

   _____

   _____

   _____

   _____

   (b) In which area do you think you can improve your development?

   _____

   _____

   _____

   _____

   _____

SEND FOR CORRECTION

(c) Why do you think these improvements are necessary?

_____

_____

_____

_____

_____

2. List several things that you do well.

_____

_____

_____

_____

3. List one thing you do not do well.

_____

_____

(a) Tell what you might do to improve in this area.

_____

_____

_____

_____

_____

_____

SEND FOR CORRECTION

End of Lesson 1

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

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Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

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Health: _____

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FIRST DAY

To begin your study on, How you Learn, you read about things that can be done without learning. Things we do without learning are called *REFLEX ACTS*. A reflex act consists of a stimulus and response. A stimulus is often called a message. The message must be carried to parts of the body before there is a response.

In the hydra we saw that a stimulus or message was sent along nerve fibres until it reached the muscles in the hydra's body. The muscles gave a response to the message or stimulus received.

Today you are going to study more reflexes in your own body. What happens in your body in response to a stimulus?

PROBLEM: To identify the stimulus and response in two common reflex acts

MATERIALS: a small flashlight, a partner

PROCEDURE: First, ask your partner to sit on the edge of a table. Be certain that the legs hang loosely and that the feet do not touch the floor.

Now ask him to close his eyes. Then tap him just below the knee with the edge of your palm. Watch to see what happens to the leg.

Now, let your partner tap you below the knee.

Close the blinds or curtains and ask your partner to turn away from the light. Then turn on the small flashlight and FROM THE SIDE, flash the light at his eyes. If you use a large flashlight, do not shine the light directly into his eyes. Direct the beam past his head. Watch to see what happens to the pupils of his eyes.

Ask your partner not to respond to the light. In other words ask him to control his response.

RESULTS: Tell what happened to your partner's leg and to your leg when it was tapped.

Tell what happened to the pupil when the light was shone past the eyes.

Was your partner able to control his response to the light?

When you tapped your partner's knee the leg probably kicked outward without effort from your partner. The same thing probably happened to your leg when the knee was tapped. This is a common reflex act.

In the darkened room, the pupil of the eye was probably quite large. When the light was on, the pupil probably became smaller. This is a common reflex act.

CONCLUSION: Identify the stimulus and the response in the investigation with the tap below the knee.

Stimulus _____

_____

Response _____

_____

Identify the stimulus and the response in the investigation with the eye.

Stimulus _____

_____

Response _____

_____

Your partner was not able to control his response to the light. What does this tell you about reflex acts and your control over them?

_____

_____

_____

_____

_____

_____

_____

_____

_____

SEND FOR CORRECTION

SECOND DAY

Last day you identified the stimulus and response in two common reflex acts.

Reflex Act

Stimulus - tap below the knee
Response - the lower leg kicked out

Reflex Act

Stimulus - the light in a darkened room
Response - the pupil became smaller

In both of these reflex acts, the stimulus or message had to travel to certain parts of the body before there was a response. There is a very short time between the stimulus and the response. This means that the message travels very quickly in the body. What means of transportation does your body have, that can carry a message or stimulus so quickly? Today we will find an answer to this question.

The transportation system which carries stimuli in your body is the *NERVOUS SYSTEM*. When you think of a system, you perhaps think of many parts that work together.

For example: The bus system in a city consists of many buses working together. They give people transportation from one part of the city to another.

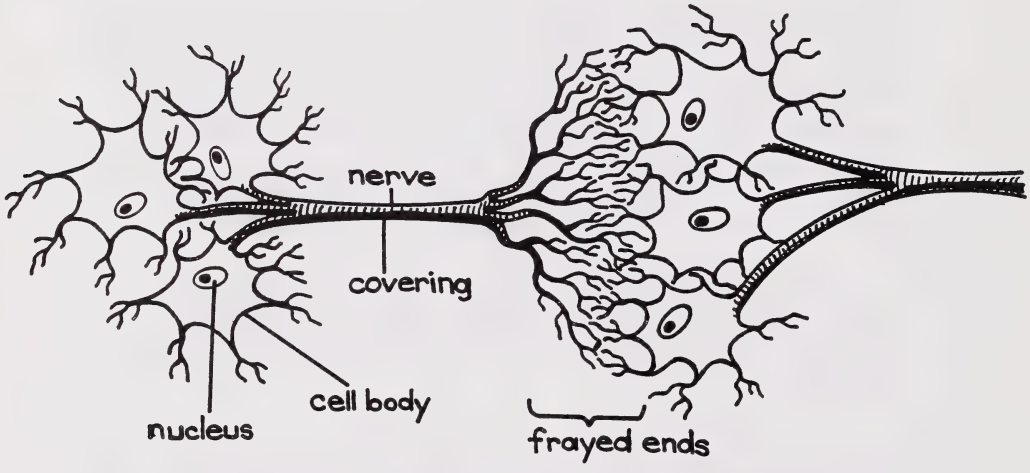
Your nervous system carries or transports messages or stimuli to parts of your body. The nervous system in your body consists of

- the brain,
- the spinal cord, and
- the nerves.

The nerves form the connection with the brain and spinal cord. Study the diagram of the nervous system and identify each part as shown in

Concepts in Science 6		*Concepts in Science 6*
FIRST EDITION	or	SECOND EDITION
page 12		page 12

A nerve is really made up of many nerve cells. Study the diagram of a nerve cell as shown below.



The fibres from many cells are grouped together in bundles. The bundles of fibres are wrapped in a protective covering. The bundles are called nerves. Each nerve is frayed out at the end to come in contact with other cells – skin and muscle and other nerve cells.

Nerve cells are often called *NEURONS (nür-ons)*. There are 3 main kinds of nerve cells or neurons. They are:

- sensory neurons,
- connecting neurons, and
- motor neurons.

These 3 kinds of neurons are at work in reflex acts. They transport the message or stimulus to parts of your body. The transportation of the stimulus is called a nerve impulse. We are not sure what a nerve impulse is like, but whatever it is, chemical or electrical that travels along a nerve, it is called a nerve impulse.

Read about how the 3 kinds of neurons are at work in a knee reflex

Concepts in Science 6 FIRST EDITION pages 14 - 15	**or**	*Concepts in Science 6* SECOND EDITION pages 14 - 15 .

In a knee reflex, the lower leg will kick forward. What happens in your body in the split second between the stimulus (tap below the knee) and the response (kicking out of the leg)?

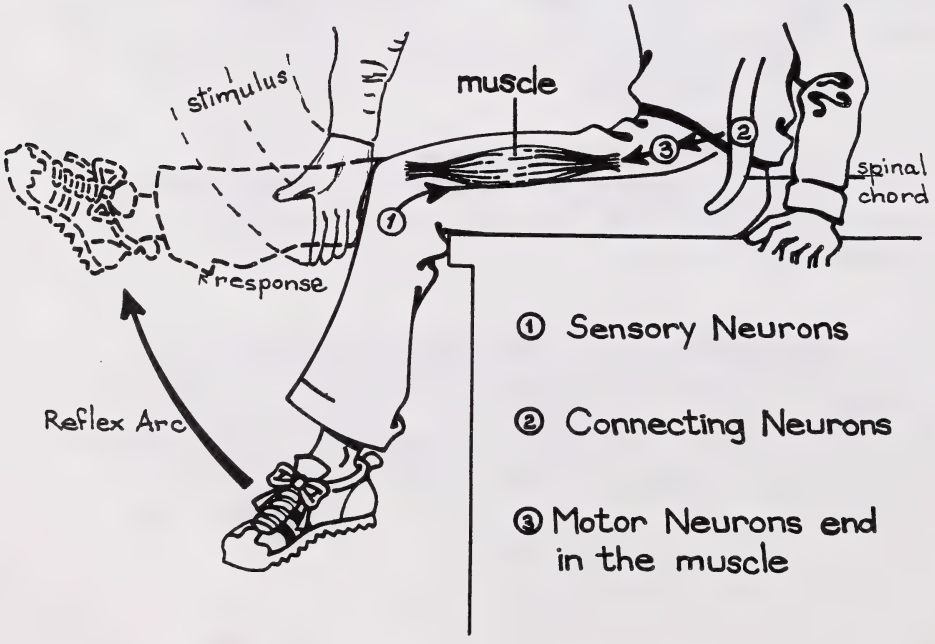
Study the diagram on the next page as your supervisor reads about the 3 kinds of neurons involved in a knee reflex.

Neurons in a Knee Reflex

SENSORY NEURONS: The nerve endings of these cells *sense* the stimulus of the hand tapping the knee. This message is carried by a nerve impulse to the spinal cord.

CONNECTING NEURONS: These nerve cells connect the sensory neuron to the motor neuron. Connecting neurons are generally found in the spinal cord or brain. A connecting neuron carries the impulse from the sensory neuron to the motor neuron.

MOTOR NEURONS: These nerve cells carry the impulse toward a muscle or gland. That is, motor neurons carry the impulse to part of the body which will respond by moving or acting.



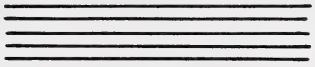
Remember that the knee reflex like other reflexes is an inborn, or unlearned action. It is as if the neurons know what to do from the very day you were born.

You may like to make a model of a nerve with the following materials.

- tape

- string

Take several strands of string and collect them into a bundle.



Wrap tape around the bundle of strings.

1. Identify the nerve in this model.

_____

_____

_____

_____

2. Identify the protective covering in this model.

_____

_____

_____

SEND FOR CORRECTION

THIRD DAY

You have read and studied about reflex acts for the past few days. Reflex acts are actions you can do without learning. A reflex act consists of a stimulus and a response. The message or stimulus is transported in the body by a nerve impulse. There are 3 kinds of nerve cells or neurons involved in carrying this message or stimulus. They are the *sensory*, *connecting* and *motor* neurons. You do not have to train these neurons to carry a stimulus for a reflex act. These neurons knew how to carry a stimulus from the day you were born.

A reflex act is an unlearned act. Today you will study *learned acts*. An example of a learned act is:

- responding to the sound of a name.

If you have a pet you probably taught it to come when you called its name. How did you teach your pet to know its name? Did you pat it on the head each time you called his name? Perhaps you taught your pet some tricks. How did you do it? Give your answer on the lines below.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Today you are going to read about a dog who was taught to come at the sound of his name. Learning to come at the sound of a name is called *simple learning*.

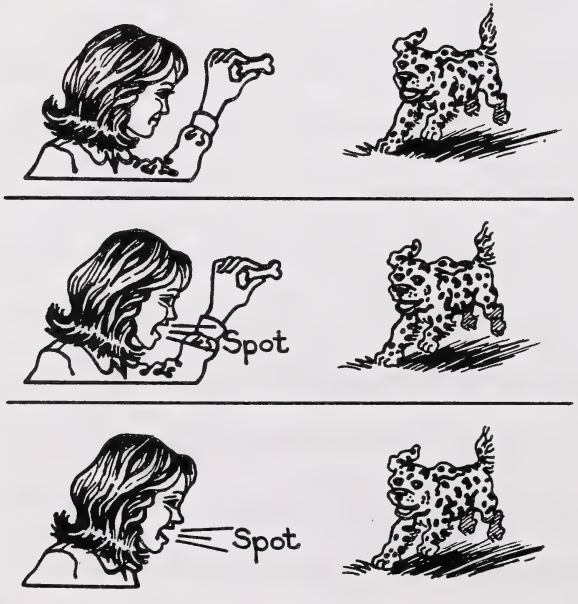
Concepts in Science 6
FIRST EDITION
Teaching an Animal
A Learned Act
One Explanation of Learning
pages 16 to the end of column 1 on page 18

or

Concepts in Science 6
SECOND EDITION
Some Puppy Reflexes
Learning an Act
Reward and Learning
pages 16 - 18

The dog in your science text did not know his name at first. However he learned to come at the sound of his name. Responding to the sound of a name is a learned act, not a reflex act. However to teach a dog to respond to the call of his name we can start with a reflex act. You may follow the pictures below as your supervisor reads the next page.

From a Reflex Act to Simple Learning



From a Reflex Act to Simple Learning

REFLEX ACT or INBORN RESPONSE

First Stimulus - food

Response - to come running to the food

A dog gets hungry. A dog does not learn to be hungry. Hunger is inborn. You give a dog food and it will respond by coming to the food and eating. Eating and digesting are inborn responses. The food satisfies him. It is his *reward*.

LEARNING or CONDITIONING

A *new* Stimulus - calling the dog's name

Is given with the *old* Stimulus - food

Response - to come running to the food

When food is given at the same time the dog hears its name, the dog gradually begins to *associate* food and his name. The sound of his name means food and so the dog responds by coming. The dog is *rewarded* when he gets his food.

A LEARNED RESPONSE or CONDITIONED RESPONSE

The new Stimulus - calling the dog's name

Is given *WITHOUT* the old Stimulus - (or *WITHOUT* food)

Response - the dog comes running

Explain why the dog now comes at the sound of his name alone.

The dog has learned that when he comes at the sound of his name, he will get something. Whatever he gets, a pat on the head, or some food, is a reward for coming when called. It is a good idea to give him a reward whenever he does something that pleases you.

1. What do you think might happen if you stopped rewarding your dog for coming to you, when you called him?

2. Why do you think this might happen?

3. Suppose you stopped rewarding your dog when he came to you. Instead you gave him some kind of punishment like a slap, everytime he came to you. What do you think might eventually happen? Would the dog keep coming? Why do you think as you do?

_____

_____

_____

_____

_____

_____

_____

4. You have probably noticed that the *reward* is very important in teaching the dog to come at the sound of his name. The reward seems to tie the stimulus and the response together. This kind of learning has a special name which you can read about.

Concepts in Science 6
FIRST EDITION
Page 18 - second column

or

Concepts in Science 6
SECOND EDITION
One Way to Explain Learning
page 18

SEND FOR CORRECTION

FOURTH DAY

Last day you read about simple learning which is often called *CONDITIONING*. You read how the reward ties a stimulus and response together into an *S-R BOND*. This bond could be thought of as a link in a chain.

For example: An S-R BOND

In teaching or conditioning a dog to come when called the following steps can be followed.

(a) You give the dog something to which he already responds, something he likes. The stimulus of food, for instance, will cause the dog to respond by running to it.

(b) You give him a new stimulus, his name, at the same time you give him the old stimulus, the food.

(c) You repeat this procedure again and again until the dog responds to the new stimulus alone. Then he responds when you call his name without the stimulus of food. The dog has learned. You have taught him to respond to a new stimulus.

You have read about training or conditioning a dog to come at the sound of his name. How could you condition a goldfish to respond to a flash of light? You will not be able to actually carry out such an investigation unless you have some fish. However, you can make a plan for teaching or conditioning a fish to respond to a flash of light. In your plan you can use fish food and a flashlight.

Tell *what* you would do to teach or condition a fish to respond to light. You should have 3 short paragraphs. Be sure to tell

- what the stimulus is.
- what reward will be associated with the stimulus.
- what results you expect.

You may use *Concepts in Science 6* text page 18 and the pictures on page 19 of the first or the second edition, to help you with your paragraphs.

SEND FOR CORRECTION

SEND FOR CORRECTION

Underline the correct answers in the following questions.

A. 1. The central part of your nervous system is the

a) brain and spinal cord . b) nerve cell .

2. A reflex act, such as the knee reflex, takes place

a) after thinking . b) without thinking .

3. A neuron which ends in a muscle or a gland is a

a) motor neuron . b) sensory neuron .

4. The neuron (connecting neuron) which generally connects motor and sensory neurons may be found

a) near the muscles . b) in the spinal cord .

5. The neurons responsible for a reflex act are

a) already connected at birth . b) developed as you learn .

6. Answering to a name is a

a) reflex act . b) learned act .

7. To speed up the act of conditioning, it is useful to associate

a) a reward with the act . b) punishment with the act .

SEND FOR CORRECTION

8. S-R bonds help explain

a) conditioning . b) all learning .

B. In a camp for boys, one of the older boys was put in charge of a bunkhouse where six other boys lived. He found that it was difficult to get them up in the morning to do the chores. In order to help them get up on time, he decided to ring a bell.

Once they were awake, he asked the boys to do chores of all kinds — sweeping the bunkhouse, cleaning up, folding their clothes. Soon the boys did not respond to the bell; some went right back to sleep. Others made believe they were asleep.

What do you think was wrong? How would you correct it?

SEND FOR CORRECTION

FIFTH DAY

Health

What Is Good Mental Health?

What do you think is meant by good mental health? Do you think that a person has good mental health if he is always successful? Do you think it means that a person is always happy, never disappointed and never angry? Do you think that a person has good mental health if he is liked by everyone and has many friends?

All these factors are important. However, your mental health depends on what you do. Just as you practice good eating habits to grow physically healthy, you should practice good habits to grow mentally healthy.

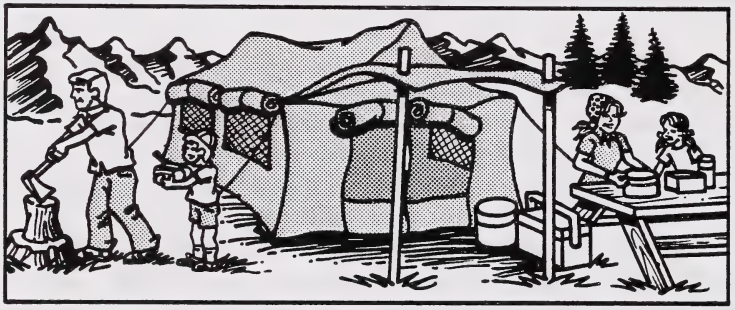
Remember when you are physically healthy, you are full of energy. You can complete your school assignments quickly. You can participate in sports and you can help with chores at home. A person with good mental health also has plenty of energy. He feels good about himself and he likes himself. In other words he has a positive feeling about himself. He likes people. If a problem arises, a person with good mental health can face the situation and solve the problem. This does not mean that the person will solve the problem correctly, but he will have the satisfaction of having tried to do something about it. Perhaps he may become discouraged or frustrated if he cannot come up with a perfect solution, but he may try many different things to solve the problem because he believes in himself.

An important point to remember is that a person with good mental health is not happy all the time. There are times when he may be sad, angry, lonely or depressed. However, these feelings do not last for a long period of time because a person of good mental health has learned to cope and to adjust himself to the demands made on him by his friends, teachers and parents.

Characteristics of Good Mental Health

loyal	dependable	honest
trustworthy		co-operative
sharing	responsible	happy
forgiving	understanding	thoughtful

Study the following illustrations.

1. 

Have you ever been on a camping trip with your family? _____

What made the camping trip fun for everyone?

_____

_____

_____

Was there one incident that made you feel cross or unhappy? _____

What was it? _____

_____

_____

SEND FOR CORRECTION

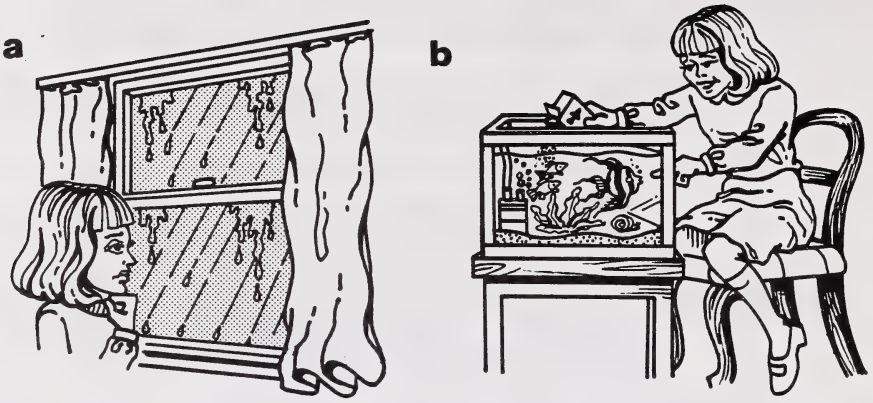
What did you do to overcome your feelings?

2.

What do you notice about these students?

Why do you think they look happy?

3.



How do you think the girl feels in picture a?

_____

Why do you think the girl's attitude is different in picture b?

_____

_____

_____

_____

_____

_____

4.

How did the boy react to his mother's statement?

_____

_____

SEND FOR CORRECTION

Do you think the mother is right? Why?

_____

_____

_____

_____

Do you think the boy is right? Why?

_____

_____

_____

_____

If you were the young person in the illustration how would you react?

_____

_____

_____

_____

Have you ever been angry with your father or mother? _____

What made you angry?

_____

_____

_____

_____

_____

_____

What did you do to solve the problem?

_____

_____

_____

_____

_____

_____

5. Think about the answers you gave for each of the above situations, then write five characteristics which you think are most important to good mental health. You may choose from the list of words on page 21. Add any other words that you think describe a person with good mental health.

_____ _____

_____ _____

_____ _____

_____ _____

SEND FOR CORRECTION

End of Lesson 2

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

_____

Signature

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Teacher's Comments:

_____

Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

FIRST DAY

You have read about unlearned acts called reflex acts. Examples of reflex acts are blinking, sneezing and the beating of your heart. These are things you do without learning or thinking about them.

This morning when you dressed and washed, you probably gave very little thought to these actions. You have done them so often that you don't need to think about or concentrate completely on these actions. There is a special name given to these kinds of actions.

> An act which you can do without thinking about it, is called an *AUTOMATIC ACT*.

Sneezing and tying a shoelace are automatic acts, for you.

Perhaps you are thinking that automatic acts and reflex acts are the same thing, since both require no thinking. However, there is a difference. Remember that a reflex act is something you can do from the day you were born? Could you tie your shoelace the day you were born? It is not likely that you were able to. Were you able to sneeze the day you were born? Yes, you were.

Sneezing and tying a shoelace are each a special kind of automatic act.

Kinds of Automatic Acts

A reflex is a simple *unlearned* automatic act.

A habit is a *learned* automatic act.

Sneezing, a reflex act, is a simple *unlearned* automatic act. You could sneeze the day you were born. A habit must be *learned*. A habit is an act you learn to do so well you finally do it automatically. Tying a shoelace is a habit.

Simple habits – learned automatic acts – can be explained by the theory of conditioning which you learned about in the last lesson. For example, in tying a track shoe, an S-R bond is formed between a stimulus (need for a securely tied track shoe) and a response (tying the lace in a special way). The reward – easier running – may have established the S-R bond.

Habits can be time saving. Imagine the time it would take if each time you tied your shoelace you had to think of exactly how to twist and turn the lace to make the bow.

Some possible reasons for wanting to form a habit are:

- to save time in performing certain acts,
- for the satisfaction of being able to do something well.

How can a habit be formed?

Read:

Concepts in Science 6
FIRST EDITION
Forming a Habit
pages 23, 24, 25 and 26 to the end of the first column.

or

Concepts in Science 6
SECOND EDITION
Forming a Habit
Rewards and Goals
pages 23, 24, 25 and 26 to the end of the first column.

1. On the lines below, list the three steps for learning a habit. Write a sentence to explain each step.

SEND FOR CORRECTION

SECOND DAY

Last day you found that the three steps needed for forming a habit are:

- having a *goal* to reach,
- having a *plan* of how to reach your goal, and
- *practicing* over and over what it is you want to learn.

When you perform the act automatically without thinking about what you are doing you have formed a habit. You can use the three steps for forming a habit. You will need a half metre of one of the following: cord, rope, ribbon, or thick string.

Tying A Bowline Knot

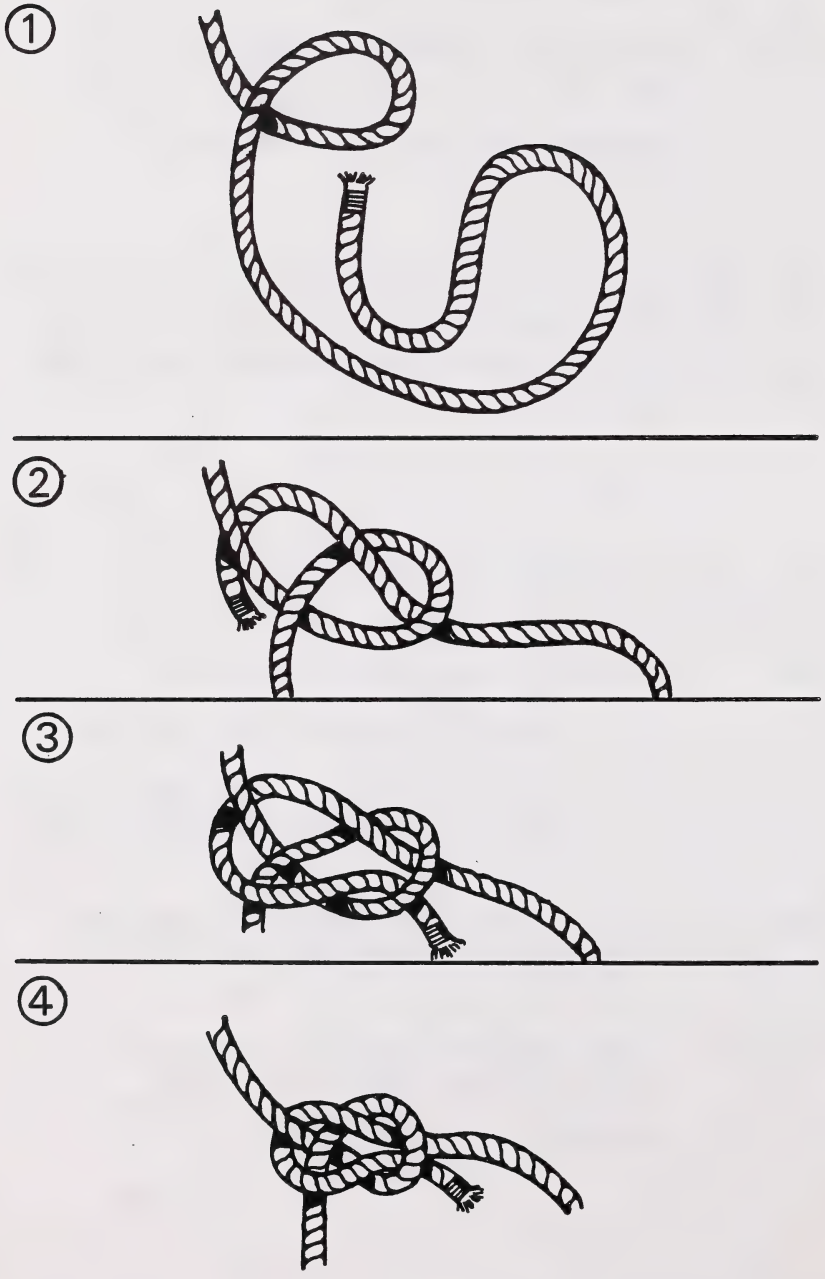
GOAL There are two parts to the goal.

- Learn the steps to tying the knot.
- Tie the knot as an automatic act. Tying the knot will then be a habit.

PLAN Learn to tie the bowline knot using the diagrams on the next page as a guide.

PRACTICE Once you know how to tie the bowline, keep practicing until it becomes an automatic act, with no time or effort wasted.

Diagrams of steps in Bowline Tying



1. Keep a record of the time from when you begin until you feel a habit has been formed.

   How long did it take you until you were able to tie the bowline knot as an automatic act?

2. You practiced tying a bowline knot until it became a habit. Do you think it is possible to form a habit without practice?

   Why do you think this?

SEND FOR CORRECTION

The habit of tying a bowline knot can be explained by the theory of conditioning. In this lesson:

- The stimulus may have been your desire to learn a new knot if you didn't already know it.
- The response was to follow the instructions given.
- The reward was that you learned how to tie a bowline knot.

1. Here is another instance of someone learning to tie this knot. Identify the stimulus, response and rewards in the following.

> Mike didn't tie the boat to the dock properly. The rope came untied and the boat drifted away. Next day after recovering the boat, Mike's dad taught him how to tie a bowline knot. Mike practiced until he could tie the knot without thinking. From then on when Mike used the bowline knot to secure the boat, there was no problem with the knot coming undone and the boat floating away.

Stimulus _____

_____

_____

Response _____

_____

_____

Reward _____

_____

_____

2. Bob has a hard time remembering to hang up his jacket when he gets home. Bob needs to form a simple habit of hanging up his coat. Design a program for Bob, using a goal, plan and practice which will help develop this habit.

3. Bob has used your program. It has helped him develop the simple habit of hanging up his jacket when he comes in. Explain this simple habit using a stimulus, response and reward.

SEND FOR CORRECTION

Up to this point you have studied reflexes and simple habits. You found that reflexes and habits are both automatic acts but with a difference. A reflex is an *unlearned* automatic act. A habit is a *learned* automatic act. A habit can be developed by having a goal, a plan and practice. Simple habits such as tying a shoelace, bowline knot or brushing teeth, can be explained by the theory of conditioning.

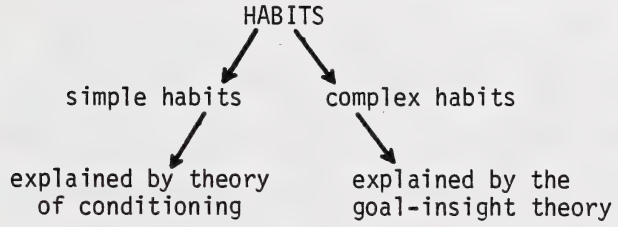
TO DO ON YOUR OWN

Do you think it would take other members of your family a longer or shorter time to form a habit of tying the bowline knot? Ask other family members to try it. Keep a record of the time. Remember, the knot must be tied as an automatic act.

THIRD DAY

Simple habits such as tying a shoelace, hanging up your clothes and putting away your books can be explained by the theory of conditioning.

If you memorize a poem, play the piano or learn to write without hesitation, a habit has been developed. However, these habits are not simple habits. They cannot be explained by conditioning. They are *complex* habits. Scientists often use the *goal-insight* theory to explain how complex habits are learned. A summary of these ideas is found in the following diagram.



What is the goal-insight theory?

A *goal* is what you wish to achieve. *Insight* can be defined as *all past experiences, information and old ideas which can help to find a solution to a problem.* Often it seems that insight comes in a "flash", as in the case of Sultan the Chimpanzee.

Read:

Concepts in Science 6
FIRST EDITION
Learning About Learning
pages 26, 27 and 28 to the end of, "Behind The Flash".

or

Concepts in Science 6
SECOND EDITION
Learning About Learning
pages 26, 27 and 28 to the end of, "Behind The Flash".

Did Sultan have all the past experience or insight he needed to solve his problem immediately? _____

Did Sultan's insight really come in a flash? _____

Sultan needed more experience before he could solve his problem. Some of his first attempts to solve the problem did not work, but all the time he was gaining experience or insight into the solution. He was learning what he could and could not do. Finally Sultan had gained enough insight and the solution for the problem was found. Sultan's insight didn't really come in a flash. He needed time to develop insight.

In the following, spelling is considered a complex habit.

> Ann wants to make a habit of spelling "receive" correctly. Ann's problem is that she cannot remember if i comes before e, or if e comes before the i. She began to think about other words containing the i and e together. She could spell handkerchief, sieve, believe, and ceiling. As she thought about these words she looked at the letters next to i and e. She noticed that i came before e except after c. "That's it!" she said "The i comes before the e except after c. Receive is spelled r-e-c-e-i-v-e." Ann used this word in written work as often as she could. She often repeated the spelling to herself. Now she spells receive without hesitation or thought. It has become a habit.

This habit Ann has can be explained by the goal-insight theory.

1. What was Ann's goal?

2. What insight did Ann have?

3. How did Ann use her information?

4. Considering what Ann did before she got the new idea, would you say that the new idea really just happened in a flash? Why would you say this?

SEND FOR CORRECTION

5. What practicing did Ann do before the correct spelling became a habit.

6. Can you think of any problem which you could solve without information or insight? If so, what is it?

7. If you need more information, where might you get it?

SEND FOR CORRECTION

Certainly, you cannot solve a problem without some insight. If you need more insight you can read and talk to people and store the information.

In developing complex habits, the more information, old ideas and past experiences you bring to a problem, the easier it will be to find the solution. As you think about the old ideas and perhaps gain more information, these are put together to give a new idea leading to a solution.

Memorizing poems, playing the piano and writing are considered to be complex habits. Such habits can be explained by the goal-insight theory. Complete the following.

> Jennifer and Carol are taking a music class in school. Both are learning how to play the clarinet. Carol is finding it easier to learn than Jennifer. Carol has taken 5 years of piano lessons as well as some theory. Jennifer has taken no special music training. The teacher says Carol has more insight and that is why she is progressing faster.

1. What goal do you think both Carol and Jennifer had?

_____

_____

_____

2. What did the teacher mean when she said Carol had more insight?

_____

_____

_____

_____

_____

_____

3. How might this insight help Carol learn to play the clarinet?

4. What will both Carol and Jennifer have to do before playing the clarinet becomes a habit?

FOURTH DAY

We now have two theories of how we learn. One is the theory of conditioning and the other is the goal-insight theory.

Some psychologists use the theory of conditioning to explain the learning of simple habits such as responding to a name or tying a shoelace. They use the goal-insight theory to explain the learning of such complex habits as writing, playing the piano and memorizing a poem.

There are times when neither of these theories can explain learning. There is still much to be learned about learning.

To review the work in this lesson, complete the following.

1. Coughing is

   a) an inborn automatic act.
   b) a learned automatic act.

2. Writing is

   a) an inborn automatic act.
   b) a learned automatic act.

3. Simple habits are

   a) learned automatic acts.
   b) inborn automatic acts.

4. The theory of learning by *conditioning* cannot explain acts like

   a) writing.
   b) tying a shoelace.

5. The goal-insight theory is often used to explain the learning of

   a) simple habits.
   b) complex habits.

SEND FOR CORRECTION

6. Review pages 23, 24, 25, 26 and 27 in your science textbook. Then explain what is meant by reflexes, conditioned learning and goal-insight learning. You may use examples from the textbook or from your experiences and observations to support your ideas.

SEND FOR CORRECTION

SEND FOR CORRECTION

FIFTH DAY

Health

Emotions and Mental Health

Last week you learned that good mental health is important if you want to feel good about yourself.

As you grow physically, you are also developing emotionally and socially. Your interactions with your peers, parents and teachers help you learn many things about yourself and the people you associate with.

You probably have learned that this year you are able to do things that you weren't able to do in Grades 4 and 5. Your father has allowed you to operate the power lawn mower this year. This shows that you are growing up physically and that your father trusts your ability to handle a power machine sensibly and with care.

Your mother has asked you to do the grocery shopping and prepare an evening meal because she trusts your ability to choose the groceries wisely and she knows that you have become a responsible person.

Perhaps this year you did not receive the fun gift you wanted for your birthday, however, you weren't disappointed or angry. You have grown up! You have learned to face disappointments because you realize that you cannot have everything you desire. You realize that you cannot always be a winner and you are not angry or upset about it. You are truly developing emotional maturity.

Remember that you do not grow up emotionally all in one day. Your emotional growth is like your physical growth. Sometimes when you grow fast physically, it will take longer to adjust your emotions to suit the changes that have taken place in your body.

Let us stop and think about the word emotion. What does emotion mean to you? Does it mean a variety of feelings?

> Emotion is a departure from the usual calm state to a strong feeling of *fear*, *anger*, *love*, *joy*, *grief*, *disgust*, *surprise* and even *hate*.

Have you ever been frightened by a sudden loud noise?

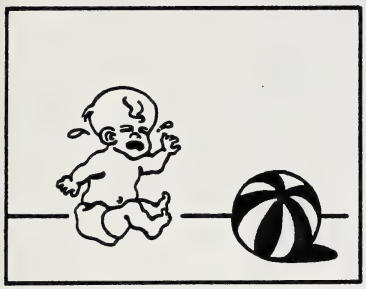
Did you notice that your heart began to beat faster?

Did you notice that your breathing may have speeded up and perhaps you felt faint and got tingly sensations in your feet and your hands?

Do you know why this happens?

The brain sends messages to many parts of your body and the actions in your body are either speeded up or slowed down. The messages from the brain alert your nervous system about your emotions, and body changes often result. For instance when you are frightened suddenly, you might scream or cry. This could be a good action, because if it is an intruder who frightened you, the scream or cry could bring help. However, the way your body functions depends on your emotions. Each year as you grow, you are also learning to control your emotions so that you won't be sad, angry, depressed, anxious or worried a great deal of the time.

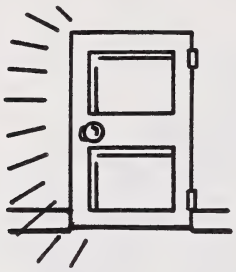
Learning to Handle Problems



Everyone has problems. Often they come from what is called a situation. Situations are things that happen from day to day which you must deal with. For example, a six-month old baby may have a problem. He may want to play with the big red ball, but he can't reach it because he hasn't learned to crawl. He may cry until his mother gives him the ball.

A year-old baby may see the same ball and he will walk or crawl to get the ball. He has grown physically and he can handle the situation. However, if the ball is in a box that he can't open, he too will show frustration and probably scream.

You have grown and learned that you can't always have everything you want, the minute you see something. Sometimes you have to postpone or put off getting what you want. One example would be not being able to go to see a baseball game you want very much to see, because you must have your lesson ready to send in on time. You give up the baseball game idea until Saturday and get your lesson done. This is called *postponing or putting off* a satisfaction for satisfaction at some other time. You will find that this decision will make you happy. Your school work does not suffer and you still have a chance to see the game.



Have you ever been in a situation in which you were angry and wanted to cry? Suppose you wanted to go to a movie, but your mother asked you to stay at home and baby sit your little brother? How would you feel? Would you be angry, unhappy? Then suppose you are still feeling angry and your little brother comes in and asks you to play catch with him. Without thinking you speak angrily to your brother, shove him out the door and slam it shut.

Why do you suppose you were angry? Were you angry at your brother? No. You were frustrated and you were showing your anger by displacing it or taking it out on someone else. This is a poor way of handling a frustration. Many family fights and disagreements start this way.

1. In a paragraph tell about a situation in which you handled a problem using the method of postponing. Be sure to tell whether you handled the problem suitably and how you felt about the decision you made.

SEND FOR CORRECTION

End of Lesson 3

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

_____
Signature

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Teacher's Comments:

_____
Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

FIRST DAY

In the last few lessons you learned about habits. Since you will be a student for six or more years, a habit you should develop is a good study habit. To form a habit you need a goal. Your goal could be: To master the habit of studying.

To form a habit, you must practice. The kind of practicing you do is important to how well you will form the habit of studying. There is *irregular* practice and *regular* practice. Irregular practice might be thought of as studying just whenever you feel like it. In regular practice, a time and place is set aside for study each day. Which kind of practice, irregular or regular, is best for developing a habit of studying? Write what you think on the lines below. Be sure to tell why you think as you do.

You can test your idea by doing the following investigation.

PROBLEM: To find if regular or irregular practice is best for developing a habit

MATERIALS: paper, pens or pencils

PROCEDURE: Ask your supervisor and a brother or sister to help you with this investigation.

Ask your supervisor and brother or sister to practice writing with the hand they don't normally use. They should practice writing their names for *20 minutes today* and *20 minutes* on *Third Day*.

Using the hand you don't normally use practice writing your name *everyday* for *10 minutes* until the end of Fourth Day.

You will report the results of your investigation on Fourth Day.

In forming a habit you should have a plan. The following statements are a plan for developing a good study habit.

1. Study each day.
2. Study at a regular time each day.
3. Study in a quiet place.
4. Have your study tools at hand.
5. Plan what you will study first and what you will study later.

Read:

Concepts in Science 6 FIRST EDITION pages 34, 35, 36 and the top of page 37	or	*Concepts in Science 6* SECOND EDITION pages 34, 35, 36 and the top of page 37.

Using the five statements on page 2, explain why each is important to developing a good study habit.

SEND FOR CORRECTION

SEND FOR CORRECTION

Remember: Did you do 10 minutes of writing practice? Did your supervisor and brother or sister do 20 minutes of writing practice with the hand not usually used?

SEND FOR CORRECTION

SECOND DAY

Last day you read about developing a good study habit. Five points were listed in a plan for developing a good study habit. Do you follow these points now? If not tell how you could improve your study habits. Use the lines below.

Remember: Today only, you practice writing your name with the hand you don't usually use. Practice for 10 minutes.

SEND FOR CORRECTION

THIRD DAY

Man is different from animals in that his brain enables him not only to learn about his environment (surroundings) but to use what he has learned to change his environment.

In the last few lessons you have had an introduction to some ideas on how man learns. To review these ideas read the following.

Read:

Concepts in Science 6
FIRST EDITION
pages 38, 39, 40 and 41

or

Concepts in Science 6
SECOND EDITION
pages 38, 39, 40 and 41.

Circle the answer that best finishes these statements.

1. Of the following, only one is not an inborn automatic act. That one is

   a) coughing.
   b) sneezing.
   c) reading.
   d) yawning.

2. Of the following, only one is not an inborn automatic act. That one is a

   a) spider spinning a web.
   b) robin building a nest.
   c) moth flying toward a light.
   d) baby saying "daddy".

3. Of the following, the neuron which carries the impulse to the muscle is the

   a) sensory neuron.
   b) motor neuron.
   c) connecting neuron.
   d) sensory nerve ending.

SEND FOR CORRECTION

4. The scientist who developed the theory of conditioning is

   a) Salk.
   c) Freud.
   b) Pavlov.
   d) Darwin.

5. A dog that responded only to food now responds to the sound of his name. This act is explained by the

   a) fact that it is an inborn act.
   c) fact that it is an instinct.
   b) theory of conditioning.
   d) theory of goal-insight.

6. A boy realizes the usefulness of saving money for something he wants to buy. This act is explained in terms of

   a) reflexes.
   c) theory of conditioning.
   b) instincts.
   d) the goal-insight theory.

7. Man can learn better than any other living thing because of his

   a) neurons.
   c) senses.
   b) nerves.
   d) brain.

8. Practice is essential to the development of

   a) an inborn automatic act.
   c) a habit.
   b) a reflex.
   d) an instinct.

SEND FOR CORRECTION

9. The first acts of a baby are

a) habits.
b) reflexes.
c) learned acts.
d) learned automatic acts.

10. As man grows up he gradually acquires

a) more reflexes.
b) more habits.
c) fewer reflexes.
d) fewer habits.

Remember: Today your supervisor and a brother or sister should practice writing their names with the hand they don't usually use. Their practice time is 20 minutes. You should practice writing your name for 10 minutes. Be sure to use the hand you don't usually use.

SEND FOR CORRECTION

FOURTH DAY

Test your understanding of the ideas you have read about in the past few lessons.

Do ONE of the following.

1. Suppose you want your cat or dog to eat at a certain time. You decide to use a bell to summon your pet. Describe how you would train your pet to respond to the bell.

2. A new puppy howls at night. The girl to whom the puppy belongs goes outside to quiet it every night for the first week.

   However, the puppy continues to howl each night. It stops only when the girl goes outside to quiet it. How do you explain what is happening?

   What theory of learning are you using in your explanation? What would you do to change the puppy's behavior? Why do you think your method would work?

3. How would you train a fish to come to the side of a glass tank which you tapped?

SEND FOR CORRECTION

SEND FOR CORRECTION

Complete the following.

1. A boy is learning to play basketball. Somehow his shot at the basket hits the rim most of the time. He gets very discouraged and asks the coach to help him.

   The coach of the team knows the way the boy stands as he throws the ball is causing him to miss the basket. The coach takes him aside and asks him to watch a boy who "shoots baskets" well. In particular the boy is asked to watch the other boy's feet as he takes his shot.

   Use the goal-insight theory of learning to explain what you think the coach is doing.

2. Which of the following statements is correct? Put a check (✓) mark beside your choices.

Good study habits save time. _____

Good study habits waste time. _____

Good study habits make learning easier. _____

Good study habits improve your grades. _____

Good study habits make no difference. _____

Practice 10 minutes more of writing your name with the hand you don't usually use.

3. On First Day, Lesson 4, you began an investigation into two kinds of practice – regular-irregular practice. You wanted to find out if regular or irregular practice was best for developing a habit. Today you will find out.

First have your supervisor and brother or sister write their names using the hand they don't usually use.

Now you write your name as you have been practicing.

RESULTS: Who wrote his name the best and with the most ease?

_____

_____

With whom was the habit best developed?

_____

_____

SEND FOR CORRECTION

What kind of practice did your supervisor and brother or sister use?

_____

_____

What kind of practice did you use?

_____

_____

CONCLUSIONS: After doing this investigation which kind of practice do you think develops a habit best?

_____

_____

_____

_____

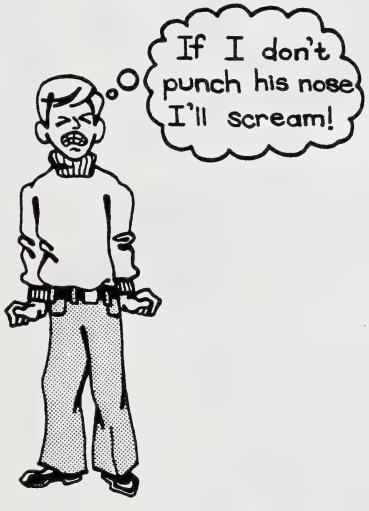
_____

SEND FOR CORRECTION

FIFTH DAY

Health

Handling Emotions



You have learned that -

- Emotion is a departure from the usual calm state to a strong feeling of fear, anger, love, joy, grief, disgust, surprise and even hate.

- You have also learned that situations and emotions can be handled in different ways.

Anger is a hard emotion to control. To cry, swear, hit someone, smash things, or try to get even is a childish way of handling this emotion.

As you grow older, you learn to handle these angry bouts in a more mature way. Sometimes you may find that counting to ten helps. Making a tape recording about your anger, then listening to the tape is a good way to let the anger out of your system. Often when you hear the problem on tape you realize it was not so important.

When you control your anger even for a short time, you will likely find that your feelings of anger are not too strong. But do not try to keep these angry feelings inside of you. For as long as these feelings are bottled up inside you, you will feel mean and unhappy and you will likely "take them out" on others.

Talk about your feelings with your parents, your best friend, a minister or your teacher. Talking to the right person is very important in helping you come to a decision or in finding a solution to your problem. The person can help you understand the reason for your problem as well as the problem. The person can help you to understand yourself better.

Another good way to deal with anger is to participate in some vigorous physical activity. If you can, you should go

outdoors for a very brisk walk, ride your bicycle, or just clean up your room. You will find that when you are finished, your anger is gone and you feel happy.

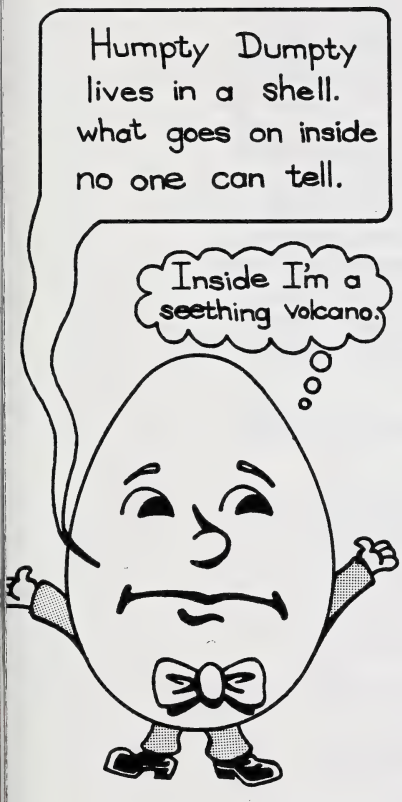
Fear, like anger is an emotion. Fear can be a useful emotion. Fear of failing in a school subject may make you study harder with the result that you will make satisfactory grades. Fear of crossing streets can make you more alert and actually save your life.

Fear is an emotion that is learned through unpleasant experiences or from stories told by your friends. Sometimes you fear things that you do not understand or know about. This is especially true of visits to the dentist's office. You don't know what to expect and probably think that you will experience a great deal of pain. When you experience a painless, pleasant dental appointment, your fear will go away. Some fears do not go away as easily.

If you have fears that have bothered you for sometime and give you worries and anxieties, you should talk them over with your parents or another adult you trust.

Love is a strong emotion which everyone needs in order to be happy. As a baby, your parents showed their love for you by taking care of all your needs, feeding, bathing, holding, hugging and kissing you. Their care and affection gave you a good feeling of security, warmth, and love.

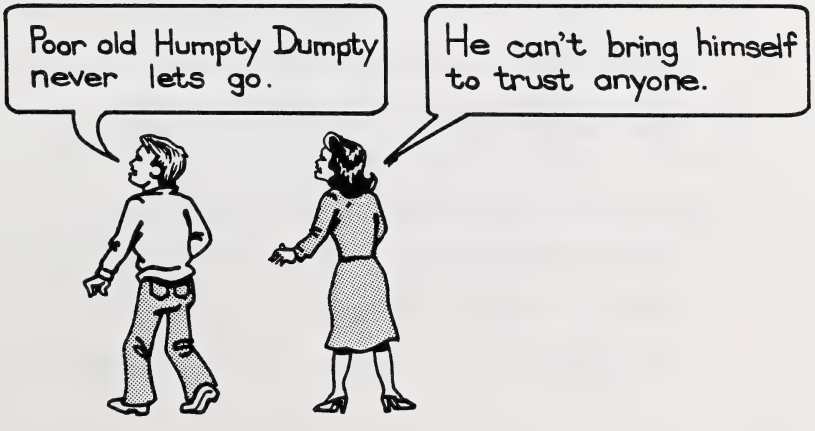
As you grow older, you will find that your parents still show their love for you but they may show it in a different way. They may still give you a hug and occasional kiss, but you will find that they show their love for you by letting you be yourself, by allowing you to make choices, by giving you more responsibilities both at home and at school. Your parents will show their love for you by listening to you and also by discussing your needs, your fears, and your problems with you. This will show that they care.



Remember that being gentle, friendly, helpful, kindly, understanding and genuinely concerned about another person, shows friendship and love for the person.

Another very important fact to remember is that emotions are not bad. You need them to keep you alive and get things done. However, emotional problems must be solved. If a person refuses to see that he has a problem and withdraws from the problem, he is really closing himself off from other persons. He seems to build a wall or shell around himself so that no one can communicate with him or help him. This is a very dangerous thing to do because the longer a person keeps to himself, the harder it is to break the shell and face the problem. You can lose friends and become very lonely. It is best to talk to someone you trust about your feelings.

As you grow into your teens there will be more and more times when you will have feelings that will upset you. Do not worry about them. This is part of growing up. Just be patient with yourself and do everything you can to learn how to handle your feelings. When you are cross, worried, angry, or afraid, it is a good idea to talk with someone you trust. He or she may be able to help you. The more you learn and practice controlling your emotions the more grown-up you are becoming.



Study the following situations or problems. Tell what emotion is expressed. Write several sentences telling how you would handle the problem.

1. Dick and Joan who lived in Cardston, Alberta, spent two weeks with their parents touring the city of Vancouver. One day Dick suggested that they put the car on the ferry boat and go across the bay to tour Victoria on Vancouver Island. Everyone agreed that this was an excellent suggestion. After all neither Dick or Joan had ever been on a ferry boat before. Next morning, however, when Dick's father drove up to the pier and made arrangements to board the ferry boat and transport the car, Joan burst into tears and said, "I won't go, I won't go. You can't make me get on that boat. Oh, Dad, don't make me go."

   (a) What emotion do you think Joan showed in this situation?

   _____

   _____

   _____

   _____

   (b) How do you think her parents solved the problem?

   _____

   _____

   _____

   _____

   (c) What would you have done if you were Joan?

   _____

   _____

   _____

   _____

2. One day John tells his mother, "I am not going to school this morning. I have to give a stupid oral report and I know all the students will laugh at me. I would rather not get a mark for current events than have to stand up in front of the class."

(a) What was John's problem?

_____

_____

_____

_____

(b) What do you think his mother did to help solve John's problem?

_____

_____

_____

_____

(c) What would you do if you were John?

_____

_____

_____

_____

SEND FOR CORRECTION

3. Cindy went to the closet to get her new red school jacket. The jacket wasn't in the closet. "Marnie has taken my new jacket again. This is the second time she has taken it and I have to wear this grubby old coat. I haven't had a chance to wear my new jacket once." Cindy picked up her books, then she dropped them on the floor. She even kicked some of the books around the floor until pages flew out.

(a) What was Cindy's emotional problem?

_____

_____

_____

_____

(b) Would you have acted in the same way?

_____

(c) What would you do in a situation like this?

_____

_____

_____

_____

(d) How do you think Cindy can solve the problem of the jacket?

_____

_____

_____

_____

4. Write a short paragraph telling about a situation in which you showed frustration, fear, or anger. Be sure to give the problem and tell how you handled the problem.

Relax by doing one of the exercises presented in the Elementary Handbook. The pushup exercise is excellent for strengthening your arm and shoulder muscles.

SEND FOR CORRECTION

End of Lesson 4

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

_____

Signature

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Grading Scale:

A - Very Satisfactory
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C - Needs Attention
D - Unsatisfactory

Teacher's Comments:

_____

Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

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Work and Machines

There are hundreds of different kinds of machines. However all of these machines are made up of a few *SIMPLE MACHINES*.

In this unit you will investigate what man has learned about machines. Machines, even the simplest, can help you do work.

Before you investigate how machines help you work, let's have a close look at the idea of work itself.

FIRST DAY

What does the word *work* mean to you?

_____

_____

_____

_____

_____

Perhaps when you think of work, you think of the amount of *force* or strength you have to use to do some work. Some work takes a lot of force or strength, while other work takes very little force.

The following is a list of jobs. Some of these jobs take less force or strength than others. Number these jobs according to the amount of strength needed to perform the job. Begin with number one for the job needing the least force.

- moving a piano _____
- lifting a pencil _____
- hauling dirt in a wheelbarrow _____

Each day you use force to do work. Some work requires such a small amount of force, that it hardly seems like work. What work have you done today that required very little strength or force?

_____

_____

_____

_____

_____

_____

SEND FOR CORRECTION

What work have you done today that required alot of strength or force?

During play, as when playing baseball, a great deal of force is often used to lift or move objects. Force is a part of work. How are play and work the same?

Would you say work is a part of play?

Why do work and play often seem so different?

SEND FOR CORRECTION

SECOND DAY

Force is a part of work. However, is that all there is to work? Suppose you had to move a huge fallen tree out of the path of your bike. You might tie a rope around the tree and then try pulling the log out of the way. You could tug and pull, and still not be able to move that log. You would use a lot of force, but would you have done any work since the log hasn't been moved? What do you think? Explain your answer.

Is your idea of work like Jim's or Paul's ?

PAUL: I have being trying all morning to get this piano moved. I've pushed and pulled but I can't move it. Boy, have I worked hard!

JIM: Well, if you haven't moved the piano, you haven't really worked at all.

PAUL: Haven't worked! Look at the perspiration on my forehead! That proves I've worked!

JIM: It only shows you have used a great deal of force or strength.

PAUL: I think our ideas about work are quite different.

SEND FOR CORRECTION

JIM: Yes. It is common for people to think that just using force alone means they have done work. They have really only tried to do work and of course trying can be very tiring. Work has not been accomplished until the object has been moved.

PAUL: Well then, I am sure tired from trying to get some work done. Jim will you help me move this piano? Jim? Where are you? Some friend! First he tells me I haven't worked, then he ducks out of helping me get some work done.

From this conversation you can see that in order to do work, an object must move.

Go back to the example of moving the log. Is your first answer about work, correct? If not, correct it on the lines below.

_____

_____

_____

_____

_____

_____

THIRD DAY

Work includes force and movement of an object. The distance that an object is moved is important too. Suppose you pulled your dog in a wagon down your street. Now think of pulling your dog in a wagon to the other side of town. You would use the same amount of force to keep the wagon moving during both trips. On which trip would you do more work?

Explain your answer.

More work is done the second time because a greater distance has been travelled. *When you use force over a greater distance, more work is done.*

Imagine that you are helping to clean the yard, by hauling leaves and dirt in a wheelbarrow. The distance you must travel each time is the same. On the first trip you hauled leaves, while on the second trip you hauled dirt. On which trip did you do more work? (Hint: Ask yourself which load will be heavier.)

SEND FOR CORRECTION

Explain your answer.

_____

_____

_____

_____

_____

_____

The load of dirt will be heavier. It will take more force or strength to keep the wheelbarrow full of dirt moving. *When more force is needed to keep an object moving more work is done.*

The amount of work done depends on:

- the amount of force needed to keep an object moving and

- the distance the object is moved.

FOURTH DAY

Today you will review some of the ideas you read about in the past three days.

Using the ideas of force and movement through a distance, explain what work is.

Give an example of work being done.

Give an example of a time when force is being used, but no work is done.

SEND FOR CORRECTION

Who is doing more work in this picture? Why?

SEND FOR CORRECTION

FIFTH DAY

Health

Social Maturity and Mental Health

As you grow physically and develop emotional maturity, are you also developing a social maturity? Yes, you are. Each year as you grow taller, you are also developing in a social manner. This means that as you get older, you learn how to get along with your own peer group as well as with adults.

You probably are learning that you prefer being with boys and girls your own age, but you also enjoy your parents' company as well as the company of other adults.

You are really developing in a very normal way as most people enjoy having people around them. You have your family members with you at home and you are learning to live with them by sharing the work loads at home and also the leisure time.

As a family member you have learned to co-operate with each member in your family so that a harmonious type of home life is achieved. When there is harmony and co-operation in a home, you will find that you are happy and you have a good mental attitude towards life. This is a healthy situation and so, each day you grow into the special person that you are.

In this busy world of ours, in which people from many different countries live, we all have to learn to get along together if we expect to continue to live and work together. We must all work together and co-operate, not only with our family members and with our friends, but with the many persons with whom we come in contact each day of our lives. It is through this kind of co-operation that different types of organizations are formed. As examples, we have the Boy Scouts, Red Cross, 4H Clubs, and even school clubs. None of these organizations would have been realized if people did not co-operate and work together.

Have you ever worked with your friends or your family on some project or plan? Did someone have to depend on you to get something done? Think about this.

1. Make a list of the people you see each day. After each person's name tell what the person does, then tell how you co-operate with each one of the people on your list.

2. Study the list carefully, then in a sentence or two tell how:

   (a) your family co-operates with you.

   (b) your friends co-operate with you.

SEND FOR CORRECTION

(c) your teacher co-operates with you.

3. Why do you think it is important to co-operate with people?

4. What do you think would happen if you did not co-operate with members of your family?

SEND FOR CORRECTION

End of Lesson 5

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

_____

Signature

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Teacher's Comments:

_____

Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

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FIRST DAY

In the last lesson you learned that work involves force and the distance an object is moved. Some work takes a lot of force. Some work is done over long distances. Work is not done unless some force has made an object move some distance.

Sometimes, when doing work, the force needed and the distance to be covered is too much for one or two people by themselves. A machine can be used to make the work easier.

What are some of the machines you have used today?

_____

_____

_____

_____

_____

Are any of the machines you listed above a part of your body? Try to open a book without using your thumb. Try to open a window without bending your elbows. Your thumb and elbows are machines. Perhaps you have never thought of your thumb and elbow as machines. When people think of machines they usually think of buses, cars or tractors. All machines we know of today started as extensions of the human body – to help the muscles in your arms and legs.

Study the following picture as an example of how machines help us.

What do the pictures above tell you about the use of a machine and the number of people needed to do some work.

_____

_____

_____

_____

_____

With the use of a machine, the one boy was able to do the same work that 4 boys did. *Machines help us do work.*

As you work on this lesson, think about the following questions.

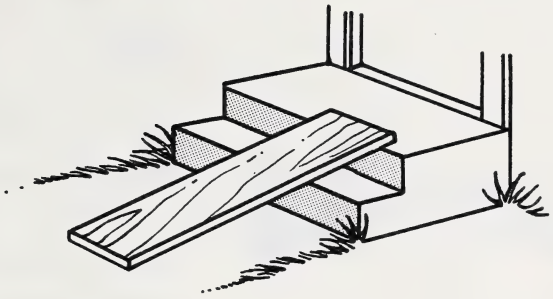
1. What are *SIMPLE MACHINES?* How do *SIMPLE MACHINCES* help you do work?

2. What are some examples of *SIMPLE MACHINES?*

SEND FOR CORRECTION

An *INCLINED PLANE* is an example of a simple machine.

This is an example of an inclined plane.



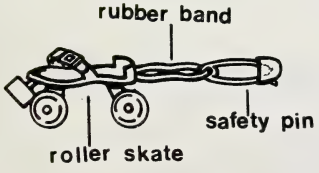
The board laid across the steps is an inclined plane.

To find out more about what simple machines are, you must investigate how simple machines, like an inclined plane, help you do work.

PROBLEM: How does the inclined plane, a simple machine, help you do work?

MATERIALS: a roller skate or similar object with rollers; books; a board about 60 centimetres long; a paper clip or a safety pin; centimetre ruler; the 14 centimetre rubber band found in your science kit (or a rubber band that will support the weight of the object with rollers)

PROCEDURE: A. Attach the rubber band to the skate. Attach the paper clip or pin to the other end of the rubber band.

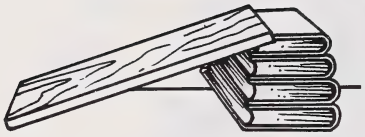


Stack several books to about 30 centimetres high.

Grasping the pin or clip slowly and smoothly lift the skate from the table to the top of the books.

With a centimetre ruler measure how long the rubber band is while continuing to hold the skate at the top of the books. Record this measurement in RESULTS.

B. Now place the 60 centimetre board so that it slopes upward from the top of the table to the top of the pile of books. This board is now an inclined plane.



With the clip and rubber band slowly and smoothly pull the skate along the inclined plane to the top of the pile of books.

Using a centimetre ruler measure the length of the rubber band while you are still holding the skate at the top of the inclined plane. Record your measurement in RESULTS.

You have lifted the skate straight up. You have pulled the skate along the inclined board. In both cases you moved the skate to a point 30 centimetres above the table.

RESULTS:

Measurement of the Stretched Band
Without the inclined plane _____ cm
With the inclined plane _____ cm

When did the rubber band stretch the least?

_____

_____

When did you have to use the least force while moving the skate?

_____

_____

SEND FOR CORRECTION

How do you know you used the least force at the time?

_____

_____

The less the band stretches, the less force is being used to move the skate to the top of the books. Most students find that less force is needed to move the skate to the top when using the inclined plane.

CONCLUSION: How has the inclined plane, a simple machine, helped you do work?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The inclined plane, a simple machine, multiplies the force of your muscles when you work. Using a simple machine is like having lots of extra muscle power. A simple machine like an inclined plane makes your work easier.

A simple machine multiplies the force of your muscles.

SEND FOR CORRECTION

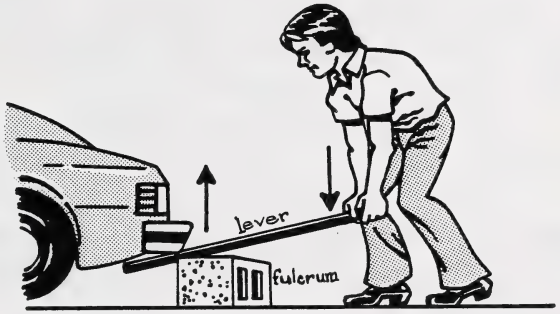
Jim hurt his leg and had to use a wheelchair for some time. The door to his house, however, is two steps up from the sidewalk. Andrew's muscles could not supply enough force to lift him and the wheelchair together. What simple machine could Jim use to get up the steps? How would this machine help Jim?

SEND FOR CORRECTION

SECOND DAY

Last day you found that a simple machine multiplies the force of your muscles. An inclined plane is an example of a simple machine. Another example of a simple machine is a *LEVER*.

The next pictures are examples of how a lever can help you do work.



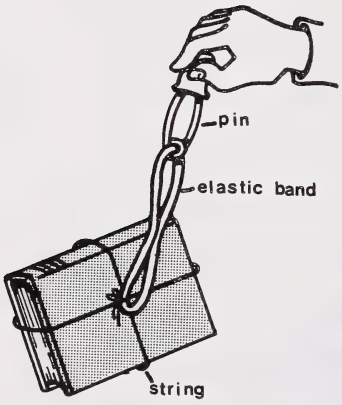
The board acts as a simple machine called a lever. The cement block and small rock are called *FULCRUMS*. The lever rests on the fulcrum. If you push the lever down on one side of the fulcrum, the other side goes up.

Let's find out more about a lever as a simple machine by doing the following investigation.

PROBLEM: To investigate how a lever helps you do work

MATERIALS: two 14 centimetre rubber bands; a book like your science text or a little lighter; heavy string or cloth strips to tie around the book; a ruler about 30 centimetres long; a centimetre ruler to measure with; safety pin or paper clip

PROCEDURE: A. Tie the string around the book. Attach the clip or pin to the elastic.



Grasp the pin and lift the book off the table.

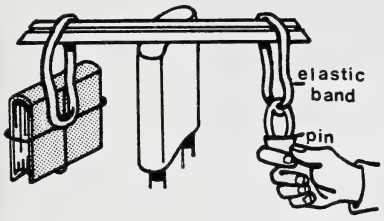
With the centimetre ruler measure the length of the stretched band as you hold the book above the table.

B. Now use one ruler as a lever with the back of a chair being used as a fulcrum.

Remove the pin from the rubber band which is attached to the book.

Remove the rubber band from the book. Attach the book to one end of the ruler, with another piece of string, about 14 centimetres long.

Knot a rubber band to the free-end of the ruler. Place the safety pin on the free end of the rubber band. See the diagram.



Lift the book up, by pulling with the pin attached to the rubber band.

With the second ruler, measure the stretched rubber band as you continue to lift the book up. Record your measurements in RESULTS.

RESULTS: Study your chart below.

Measurement of the Stretched Band
Without the lever _____ cm
With the lever _____ cm

When did you have to use the least force to lift the book?

_____

_____

How do you know you used the least force at that time?

_____

_____

SEND FOR CORRECTION

CONCLUSION How does a lever help you do work?

_____

_____

_____

_____

_____

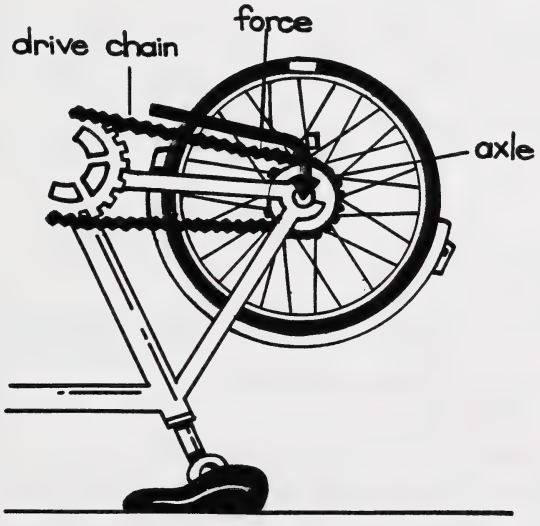
_____

A lever and an inclined plane are called simple machines because they multiply or increase the force of your muscles. The simple machines help you do work which might take 3 or 4 people to do in some cases.

SEND FOR CORRECTION

THIRD DAY

You have investigated two simple machines; the lever and the inclined plane. These two simple machines increase or multiply force. Simple machines can be used for other purposes too. An example of a simple machine with another purpose is the *wheel* and *axle*. The wheel and axle can be found on a bicycle.



If you have a bicycle, turn it upside down and examine the rear wheel. It is fastened to a small shaft called an axle. Turn the wheel , slowly, and watch the wheel as it moves. Can you see where the force is being applied to the wheel? Look at the diagram above. You will see the force coming from the drive chain is being applied to the axle.

What is the purpose of the axle and wheel? Leave your bicycle in its present upside down position and continue with the following investigation.

PROBLEM: To find the purpose of the simple machine, the wheel and axle

MATERIALS: tape and your bicycle

PROCEDURE: With your bicycle in the upside down position, place a tape or a piece of tape on one of the spokes near the axle.

Place another piece of tape on the wheel's outer edge, as shown in the diagram on page 11.

Turn the wheel again and watch to see which tape is moving faster, the one nearer the axle or the one on the edge of the wheel. If you are not sure, ask yourself which tape is moving a greater distance.

RESULTS: Which tape moved faster?

_____

_____

CONCLUSION: The tape on the edge of the wheel moves at a greater speed than the one near the center because it covers more distance in the same amount of time.

What would you say is the purpose of the wheel and axle?

_____

_____

_____

The simple machine called the wheel and axle can be used to *multiply speed.*

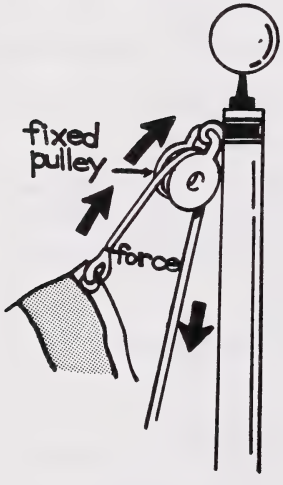
A simple machine can be used to *multiply speed.*

SEND FOR CORRECTION

FOURTH DAY

You have investigated simple machines with two different uses. The lever and inclined plane are machines used to multiply force. The wheel and axle is a simple machine used to increase speed.

The *FIXED PULLEY* is a simple machine with still another purpose. A *PULLEY* is a kind of grooved wheel with a rope around it. The pulley used on a flagpole is a fixed pulley because it is fastened to the top of the pole. Without the help of the pulley and the rope, it would be difficult to raise the flag to the top of the pole.



With a pulley the flag goes up as the rope is pulled down.

The fixed pulley, then, is a simple machine which *changes the direction of the force.*

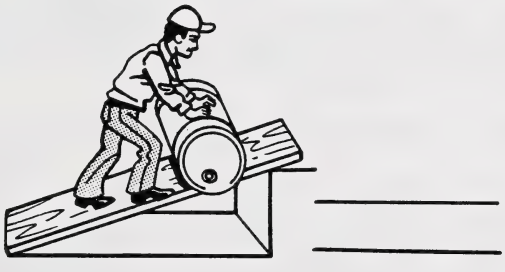
The force is in a downward direction while the flag (load) is going up.

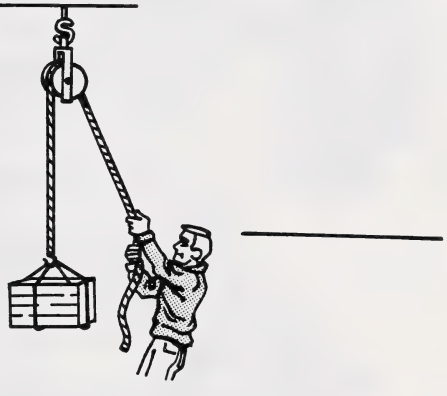
Fixed pulleys have many uses. It can be used to hoist a load aboard a ship and to open a stage curtain. Whenever a single fixed pulley is used, the direction of the force is changed by the pulley.

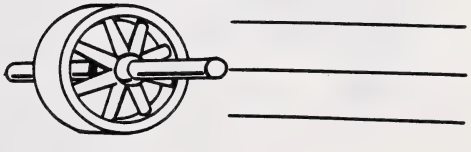
To review this week's work complete the following. Draw a line from the simple machine to its correct use.

Simple Machine	Use
wheel and axle	- to multiply force
inclined plane	- to increase speed
lever	- to change the direction of a force
fixed pulley	

What is the name given to each of the simple machines pictured below.







SEND FOR CORRECTION

FIFTH DAY

Health

Social Maturity and Responsibilities

Last week you completed a survey on how you co-operate with members in your family, your friends and your teacher.

After studying your list, did you realize that everyone has responsibilities that must be met? From your survey or list, you should have learned that each day, you depend on many different people and in turn the people you meet each day depend on you.

What do you think would happen if your local grocer decided to close his groceteria in your area?

What would happen if your teacher no longer corrected your lesson exercises?

What would happen if the mailman no longer delivered mail to your house?

Suppose all the pilots quit their jobs and there were no pilots to replace them to fly our airplanes?

Would any of these actions affect you?

Yes, they would. You have become dependent on the teacher, the grocer, the mailman and even the pilots to provide a certain service for you each day. You rely or *depend* on them and so these people must be *dependable*. When each person accepted his work or position, he in effect made a *commitment* or a *promise* to provide a certain type of service. Just as the teacher has made a promise to provide the students with teaching service and guidance, the mailman has promised to deliver the mail to the people in his area.

At this stage in your life, the people you come in contact oftenest are your parents. Do you think you depend on your mother, your father, or your brothers and sisters?

Yes, from your early childhood you have become dependent on your parents for food, clothing, shelter, love, guidance and security.

Your mother probably wakens you in the morning, prepares your meals, provides you with the clothes you wear and probably organizes your school day.

Your father or mother provide you with money for books and entertainment. They provide the time to listen to your problems and to guide you. They also provide you with a home and security. You depend on your parents because you know they are dependable. Your parents in turn want to be able to *depend* on you. They want *you* to be *dependable*. Your parents know that now you can look after your personal needs like bathing and dressing because you have learned these personal responsibilities in your growing years.

However, are you as dependable as your parents want you to be? If you promised to mow the lawn, wash the car, vacuum the livingroom rug, or shop for the groceries, would you do so?

If you promise to complete a lesson or an assignment for your teacher within a certain time, do you do so? Keeping your promises or keeping your word is very important in being dependable. You cannot meet your responsibilities if you do not keep your word.

You might feel that having to do chores at home, or completing a lesson assignment is a boring task, however, once you have completed the task you get a certain satisfaction for having the determination to stay with the job until you have finished it. This is especially true if it is a job that you completed for some member in your family. You feel that you are contributing a service for your family, that you kept your word and met your responsibility. In other words you have shown that you are a dependable person.

1. Discuss with your parents the different jobs there are to be done regularly around your home. Decide which one you can be depended upon to do each week.

Make a list of the jobs assigned to you. Post your list where you will see it. Check off the jobs as you complete them on time. Send this job list in for me to see with Lesson 8.

JOBS ASSIGNED TO ME

SEND FOR CORRECTION WITH LESSON 8

2. Study your job list. In a sentence or two tell how you have grown to be a more dependable and responsible person.

_____

_____

_____

_____

_____

SEND FOR CORRECTION WITH LESSON 8

End of Lesson 6

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

_____
Signature

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Grading Scale:

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Teacher's Comments:

_____
Signature

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FIRST DAY

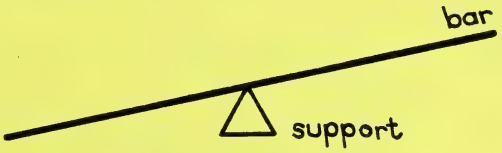
You have investigated four simple machines:

the inclined plane,
fixed pulley,
wheel and axle, and
the lever.

Let's study the use of levers more closely. How do levers work? What is the best way to use levers? These are some of the questions you will investigate in this lesson.

A lever is a simple machine consisting of a bar with a support around which it can be supported.

A LEVER

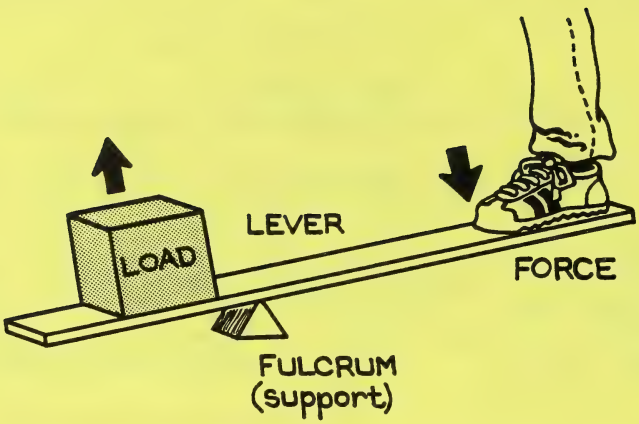


Today you may have used a pair of scissors, pried open a can with a screwdriver, or opened a packing box with a crowbar. You may have cracked a nut or pruned a branch from a tree. In each case you would have used a lever. We live with and use levers every day. Even though there are many kinds of levers, there are only three things to consider about any lever. They are the:

- FULCRUM
- FORCE
- LOAD

To what does each of these terms refer?

Study the following diagram.

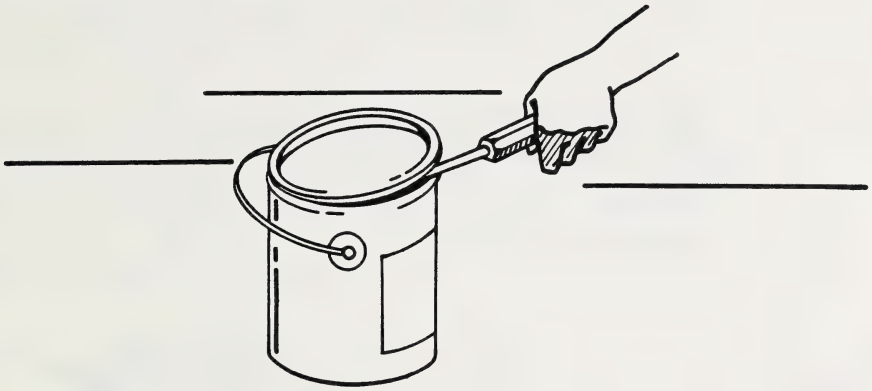


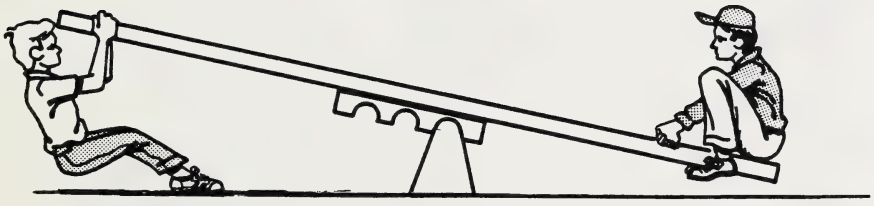
FULCRUM - is a *support* around which the lever can be turned.

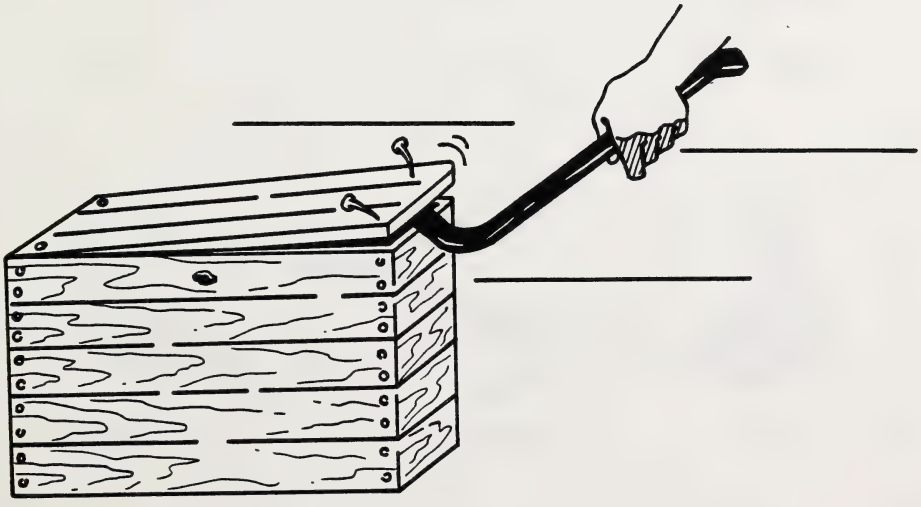
FORCE - is the *push or pull* applied to one end of the lever. The force is what you do to the lever when you are trying to lift the load.

LOAD - is the *object* resting at one end of the lever. It is the object to be moved. The load is the object which is affected in someway by the machine.

Write fulcrum, load and force in the appropriate places in the following diagrams.







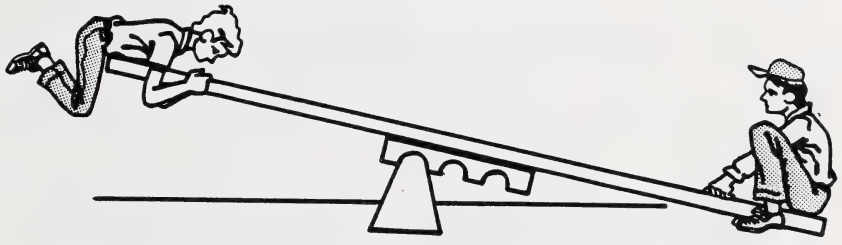
SEND FOR CORRECTION

SECOND DAY

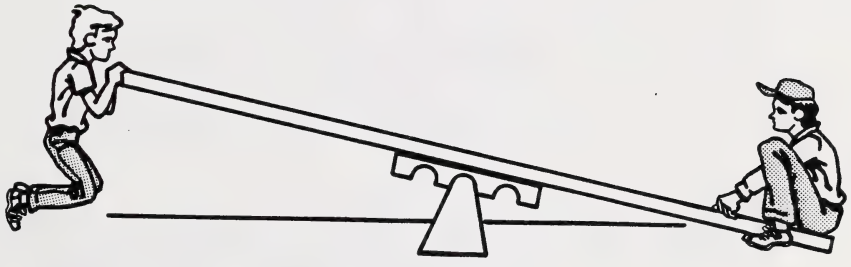
When using a lever to help you do work there are three things to consider: the fulcrum, the load and the force.

These three things can be arranged in three ways. Study the diagrams below to discover the three ways in which the fulcrum, load and force can be arranged. Notice the three slots on which the teeter totter can be placed. This means the fulcrum can be placed in three different positions.

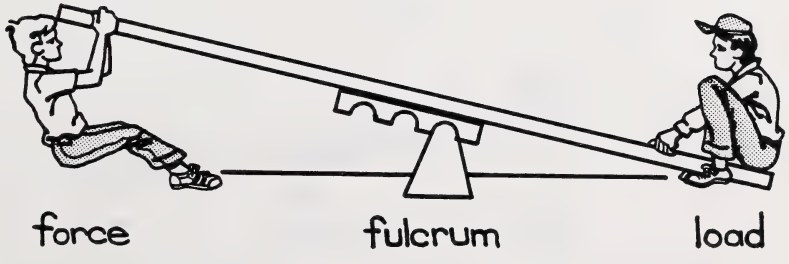
1.



2.



3.



Complete the following sentences using diagrams 1, 2, and 3 on page 4. Decide if the fulcrum is:

- closer to the load
- closer to the force
- an equal distance from the load and force.

1. The fulcrum is _____

_____

2. The fulcrum is _____

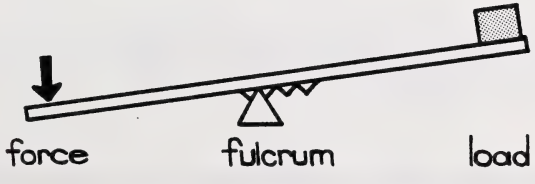
_____

3. The fulcrum is _____

_____

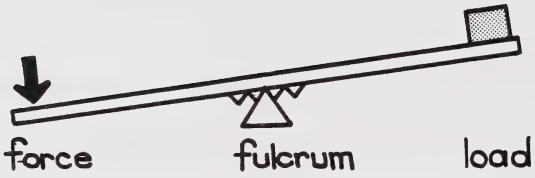
In diagram 1, the teeter totter board is placed on the slot closest to the boy applying the force. This means the *fulcrum is closer to the force.*

1 Fulcrum Closer to Force



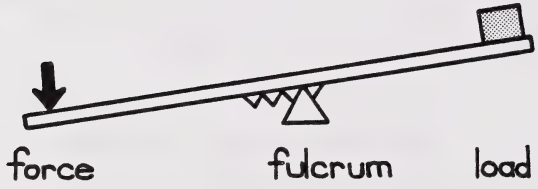
In diagram 2, the teeter totter board is placed on the middle slot. This means the *fulcrum is an equal distance from the load and force.*

2. Fulcrum Equal Distance from the Load and Force



In diagram 3, the teeter totter board is placed on the slot closest to the load. This means the *fulcrum is closer to the load.*

3. Fulcrum Closer to the Load



Perhaps you are wondering if it matters where the fulcrum is placed.

You can find out by doing the following investigation.

PROBLEM: To discover the effect of placing the fulcrum in three different positions.

- closer to the force
- closer to the load
- equal distance from the force and the load

MATERIALS: an object to be lifted-as a storage container with rice; a ruler or metre stick; a rubber band found in your science kit; a pin or clip; a support to act as a fulcrum. (Directions are given below.)

PROCEDURE: For a fulcrum you may use the back of a chair.

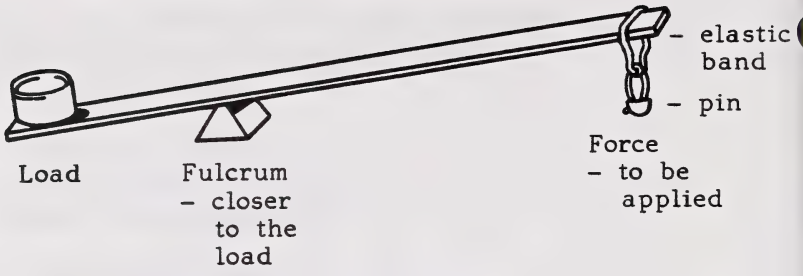
or

Make a fulcrum by cutting a small box top diagonally.

A. Grasping on to the pin or clip *slowly and smoothly* pull down on the rubber band, so that the load is lifted up as far as it can be without it falling off.

Measure the length of the stretched rubber band. Record the measurement in RESULTS.

B. Next, place the fulcrum closer to the load as shown on page 8.



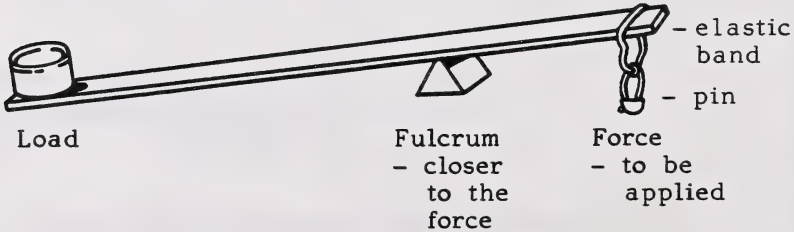
A. Grasping on to the pin or clip, *slowly and smoothly* pull down on the rubber band, so that the load is lifted up as far as it can be without it falling off.

Measure the length of the stretched rubber band. Record the measurement in RESULTS.

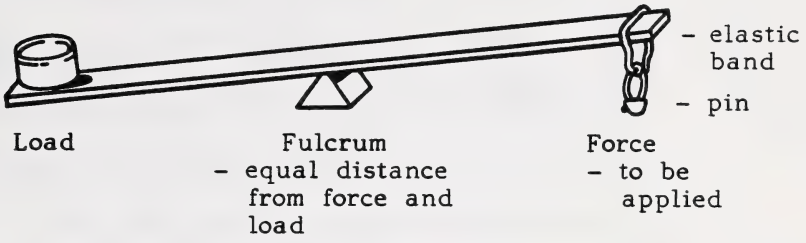
B. Place the pin or clip on one end of the rubber band. Knot the other end of the rubber band on one end of the metrestick or ruler which will act as the lever.

C. Place the lever on the fulcrum. Adjust the fulcrum so that it is *closer to the end where the force will be applied* (rubber band). - see diagram below.

The object to be lifted is the load (container of rice). It should be placed at the free end of the lever.



D. Now place the *fulcrum an equal distance from the force and load.*



Again pull down on the elastic to lift the load.

Measure the stretched band. Record the measurement in RESULTS.

RESULTS:

Measurement of Stretched Rubber Band
with fulcrum closer to force _____ cm
with fulcrum closer to load _____ cm
with fulcrum an equal distance from load and force _____ cm

Generally students find that the rubber band was stretched the most when the fulcrum was closer to the force. They also find that the rubber band is stretched the least when the fulcrum is closer to the load.

From your previous work with the rubber band as a force-measurer, you know that the more the band is stretched, the greater is the force that has been used, to lift the load.

When was the most force needed to lift the load in your investigation?

When was the least force needed to lift the load?

CONCLUSION: Does the position of the fulcrum make any difference when lifting a load? _____

Explain your answer below and on the next page.

If you had a load to lift with a lever, where would you place the fulcrum?

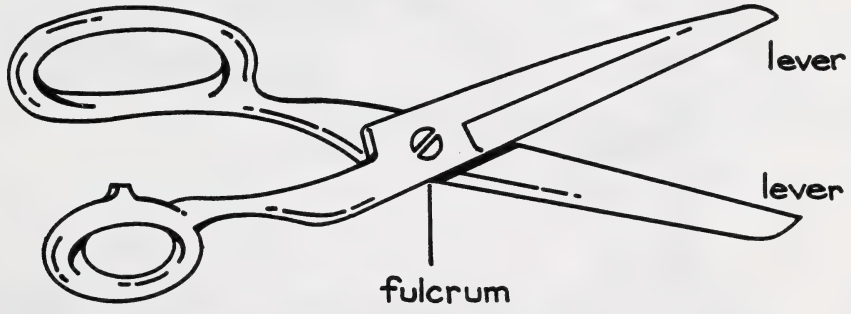
Why would you place the fulcrum there?

When using a lever the fulcrum should be placed closer to the load. When the fulcrum is closer to the load, it is also further from the force. With the fulcrum in this position less force is needed to raise the load.

SEND FOR CORRECTION

THIRD DAY

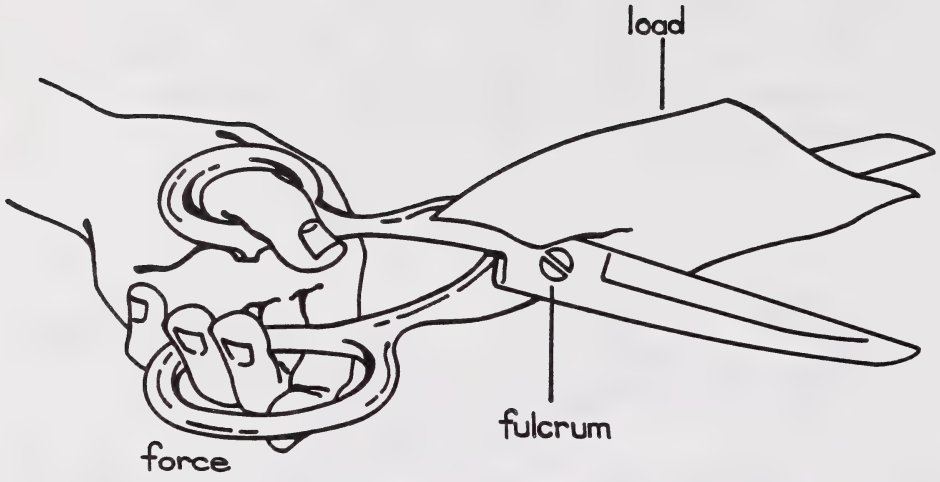
In this lesson you have learned that when you lift an object with a lever, you have applied force to the lever. Levers could be called lifting machines. However, levers are not only used for lifting objects. Levers can be found in cutting tools too. For example, the scissors below is made of two levers fastened by a screw. The screw is called the fulcrum.



From your investigation last day you saw that:

> When the fulcrum is placed closer to the load and farther from the force it takes less force to lift the load.

This idea is true for a pair of scissors too. The load is the paper or material which is being cut. The force is applied by your fingers.

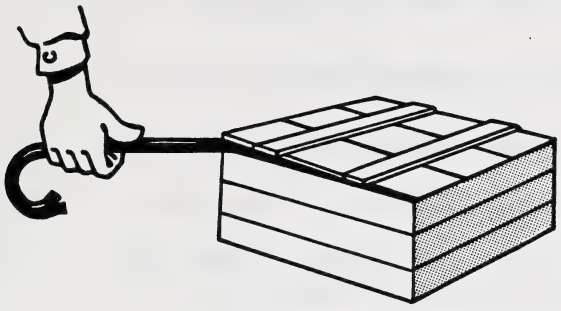


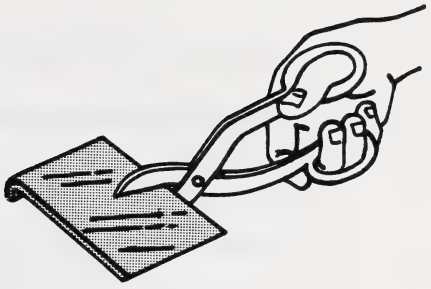
Notice that the fulcrum is closer to the load and farther from the force. With the fulcrum in this position, the paper is easier to cut.

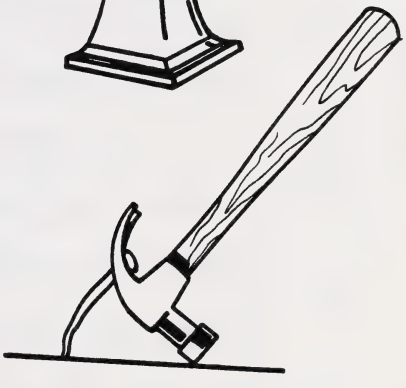
Study each of the following pictures. For each picture find:

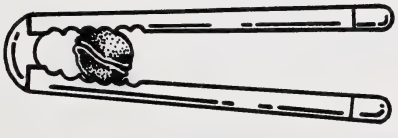
- the load. Mark it L.
- the fulcrum. Mark it Fm.
- the best point to apply force. Mark it F.

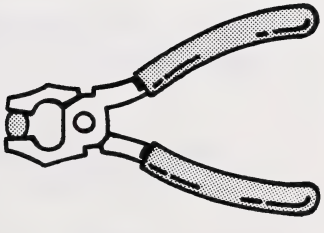
Remember that less force is needed when the fulcrum is closer to the load and farther from the force.

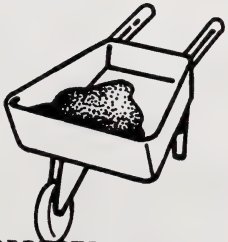












SEND FOR CORRECTION

Choose one of the pictures from page 14 and explain why you would apply the force where you indicated.

The lever is a simple machine which if used correctly can help us do work.

Complete the following questions by circling the correct answer.

1. One of the following is not likely to be used as a lever. It is a

   (a) seesaw (b) screw (c) crowbar

2. A load can be moved most easily when the fulcrum is placed

   (a) closer to the force and farther from the load.

   (b) closer to the load and farther from the force.

3. Where should the fulcrum be placed for ease in lifting the load in the picture below?

FOURTH DAY

You have learned that when using a lever, the fulcrum should be placed closer to the load and farther from the force in order to lift or move a load easily.

When you were investigating the best position for the fulcrum, the load was always kept the same. Something which is kept the same is called a *CONSTANT*. The load was a constant. The fulcrum's position was being changed or varied. The fulcrum's position was a *VARIABLE*.

The constant and variable can be changed in an investigation. For example the load could become the variable, by increasing or decreasing it. The fulcrum could become the constant by keeping in one position.

If you were to increase or decrease a load what effect do you think this would have on the amount of force needed to move the load?

To test your idea *design* an investigation and then *do* the investigation. In your investigation, the weight of the load should be varied, at least 2 times. This will be the variable in your investigation. The position of the fulcrum will be the constant. Keep the fulcrum closer to the load throughout the investigation.

SEND FOR CORRECTION

You will include the problem, materials, procedure, results and conclusion. The following is a guide for you as you design your investigation. Please read *all* of the points *before* beginning to design your investigation.

1. In the PROBLEM you will state the question you want to answer. In this investigation the question will be about increasing and decreasing a load and the effect this has on the force.

2. For the MATERIALS, tell what things you will need to carry out the investigation. You will need an object as a load. (Suggestion: rice in a container) What will you use as a fulcrum and a lever? What will you use to measure the force used? (Suggestion: rubber band)

3. In the PROCEDURE you will tell what to do with all the materials. Also tell what things should be observed and recorded in the results. Include diagrams if you wish.

4. In the RESULTS you will tell what happened in your investigation. You will tell about the force needed to raise the load. Then tell about the force when the load was increased and decreased.

5. In the CONCLUSION you must think about what you did and saw in your investigation. Decide if you have found an answer for the question you stated in the PROBLEM. If you have found an answer, write it down as your conclusion for the investigation.

Use this space and the following pages to write your investigation.

SEND FOR CORRECTION

SEND FOR CORRECTION

SEND FOR CORRECTION

FIFTH DAY

Health

Responsibilities to Your Friends and Other Adults

As you grow older, your responsibilities increase, too. Your parents probably have outlined numerous jobs for which you are responsible and you strive to complete the jobs to prove that you are a dependable person.

In order to make friends and keep them, you must show your friends that you can keep your promises. If you make a commitment to meet a friend at a certain time, try to be on time. No one likes to be kept waiting especially if an exact time was set for the meeting.

Do not make a promise to meet someone, then break the promise because something more exciting came up. Sometimes you may not be able to keep your promise especially if an urgent matter arises at home or a special club meeting is called. Your friend will understand because he knows that you live up to your promises on most occasions and that you are dependable.

A person who always makes excuses or *alibis* as to why he did not keep his promise is an *undependable* person. People cannot rely on him and he soon loses friends and credibility. This type of person is not growing in social maturity. He no doubt will become a very lonely and unhappy person.

Not only have you responsibilities to your friends, but you have a responsibility to yourself and your school work. Even though you are studying by correspondence, you have made a commitment to your parents and to your correspondence teacher that you would complete your weekly assignments on time and to the best of your ability. You should use your time wisely and follow the suggestions and directions presented by your teacher.

Meeting all your responsibilities whether it is with your parents, friends or teachers helps your social growth and makes you a more responsible person. It helps to build confidence in yourself and this motivates you to try and improve in everything you do.

When you work hard at some goal that you set for yourself, and you are successful, remember to be a gracious winner. That is, if you succeed do not be too happy and brag about your success. No one really likes a braggart. It is a good way to lose friends, too. Also,

if you fail at some task or in your school work, do not be too depressed and unhappy. You will find that all through your life you will encounter moments of great success and moments of failure.

Do not be too disheartened with a failure, but do try to find the reason for the failure, then try to avoid the same errors next time. Each success and failure helps you grow and mature into a socially mature individual.

1. Tell about some task in which you were successful. Tell how you reacted to your success. Tell how your parents and friends reacted to your success.

2. Tell about a task in which you feel you failed. Tell how you reacted to the failure. Tell how your parents and friends reacted to your failure.

SEND FOR CORRECTION

3. Make a list of two different things that happen in your life because other people are meeting their commitments.

_____

_____

_____

_____

SEND FOR CORRECTION

End of Lesson 7

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

_____

Signature

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Apply Lesson Label Here

Name _____

Address _____

Postal Code _____

Please verify that preprinted label is for correct course and lesson.

Teacher's Comments:

_____

Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

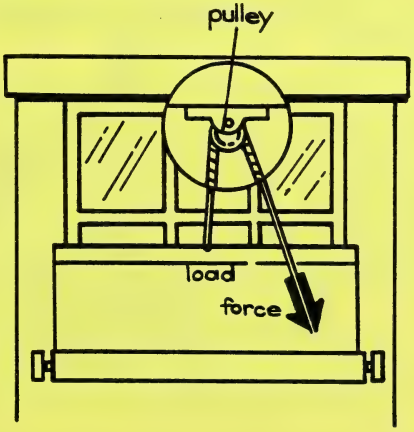
FIRST DAY

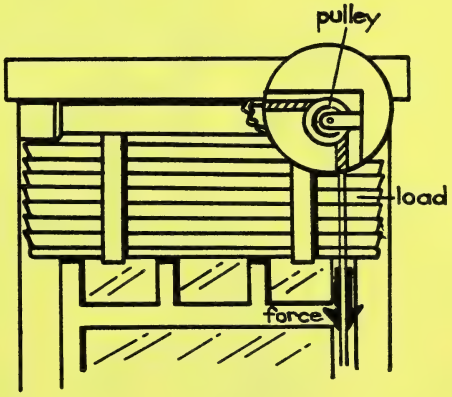
You have seen that simple machines can be used to multiply force, multiply speed and to change the direction of a force.

The lever is an example of a simple machine that multiplies force. From your last lesson, you saw that when using a lever to help you do work, it is best to have the fulcrum close to the load and far from the applied force. With the fulcrum in this position, the lever multiplies your force. This means the load can be lifted with greater ease.

The fixed pulley is another simple machine which can help you do work. In your last lesson you learned that a fixed pulley *changes the direction of a force*. Examples of the use of fixed pulleys are shown below.

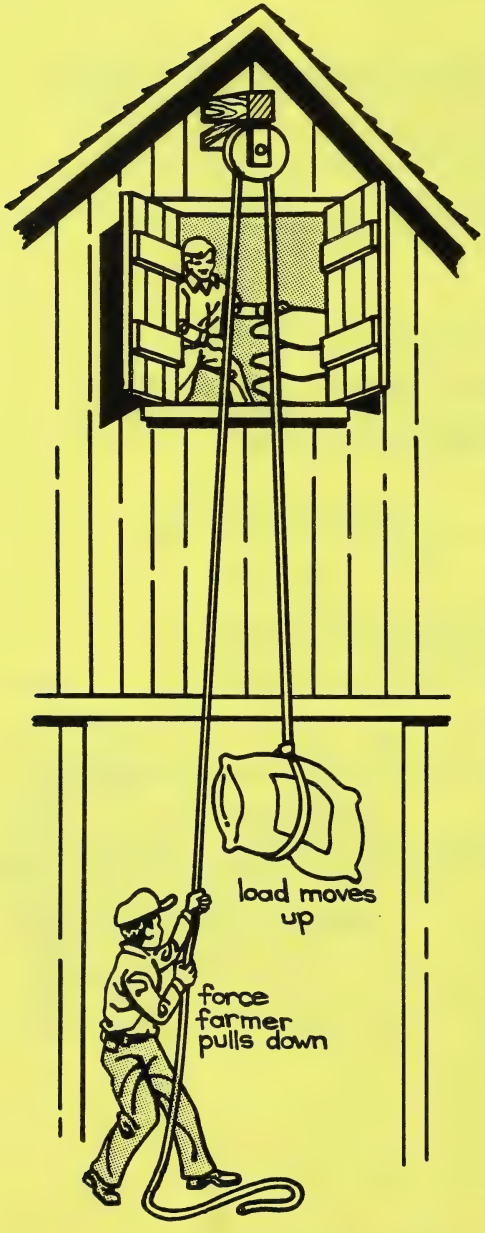
Inside the box at the top of the blinds you can find a pulley.





In the diagrams above, the load moves *up* as the force is applied *downward*.

Perhaps you have seen a scene such as the one pictured below. This farmer has used a fixed pulley to help lift the grain into the loft.



As the farmer pulls down, the grain moves up. The farmer's pull must be as great as the weight of the grain.

> When using a fixed pulley, the force applied must be as great as the weight of the load.

What would happen if the farmer pulled down with a force *less than* the weight of the grain?

_____

_____

_____

_____

_____

_____

A fixed pulley changes the direction of the force making it more convenient for the person who is doing the work.

SECOND DAY

Last day you learned that a fixed pulley, a simple machine, can be used to change the direction of an effort.

Today you will study pulleys and *movable* pulleys. When a fixed pulley or a movable pulley are used together, the system is called a *BLOCK and TACKLE*. What advantage is there in combining pulleys? You know that a single fixed pulley can change the direction of the force. Does a single fixed pulley multiply force, too? What does a movable pulley do? The following investigation will help you answer these questions.

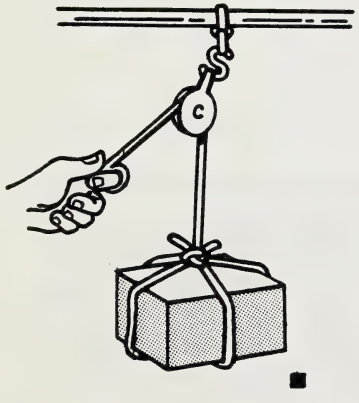
PROBLEM: Does a single fixed pulley multiply force as well as change the direction of the force?

What does a movable pulley do?

MATERIALS: some heavy cord; a heavy object such as a brick, a small single pulley, found in the science kit

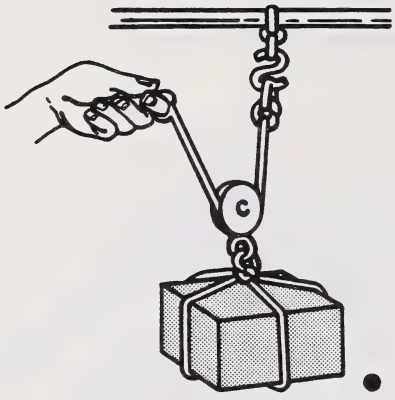
PROCEDURE:

Tie a heavy cord around a brick or other heavy object and lift it with one finger. It is not easy to do. The cord will probably squeeze your finger.



Next, fasten the pulley to a solid support, such as an overhead bar, or to a hook on the wall. Place the string over the pulley and lift the brick, as shown in the diagram ■ . The pulley is a fixed pulley in this position.

THINK: Does it seem any easier to lift the brick with a fixed pulley than to lift it with just your finger and no pulley? Write your answer in RESULTS.



What does a movable pulley do? Attach a movable pulley to the load, as shown in the diagram ● . Tie one end of the cord and lift the load by pulling up on the other end of the string.

THINK: Does lifting the brick or load seem easier when using the movable pulley? Write your answer in RESULTS.

RESULTS: Was it any easier to lift the load with the fixed pulley than with your finger and no pulley?

_____

_____

_____

_____

Was it easier to lift the load with the movable pulley?

_____

_____

_____

_____

CONCLUSION: Does a fixed pulley multiply the force when a load is lifted?

_____

_____

SEND FOR CORRECTION

What does a single fixed pulley do?

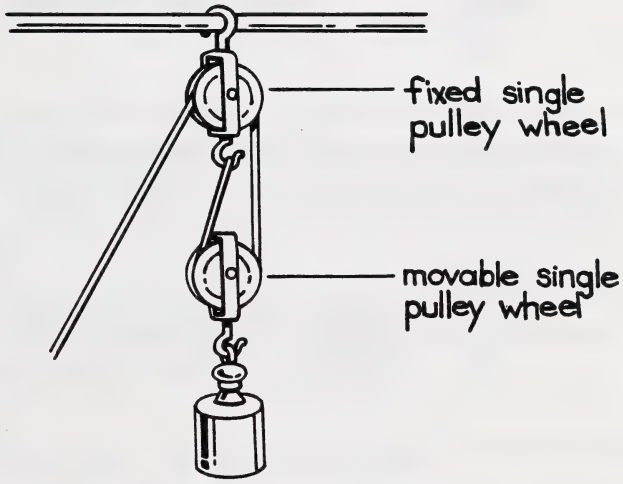
Would you say the movable pulley is a simple machine that can be used to multiply force? Why would you say this?

If you did the above investigation correctly, you likely found that the single fixed pulley does not multiply the force. It only changes the direction of the force. However, the movable pulley can be used to multiply force when lifting a load. Together, a fixed pulley and a movable pulley can be used to change the direction of a force and to multiply force at the same time.

THIRD DAY

The fixed pulley can be used to change the direction of the force. A movable pulley multiplies the force. Used together, the fixed and movable pulley form a *BLOCK and TACKLE* system. Pictured below is a block and tackle system using single pulley wheels.

Block and Tackle
Using Single Pulley Wheels



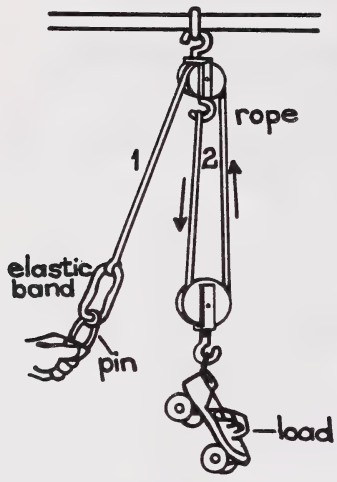
A block and tackle system can be used to lift heavy loads. The fixed pulley changes the direction of the force, while the movable pulley multiplies the force. The number of lines running through the pulleys is important. The number of lines effects the amount of force needed to lift a load.

Complete the following investigation.

PROBLEM: How do the number of lines in a block and tackle system effect the amount of force needed to lift a load?

MATERIAL: a heavy object as wood or metal toy; a pin or clip; a rubber band; two single and two double pulleys; and a piece of rope

PROCEDURE:



String the rope through the two single pulleys.

Suspend the block and tackle system from a bar or hook in the wall.

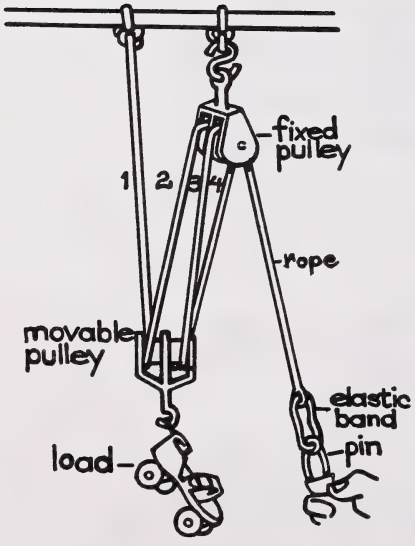
Attach the heavy object you have chosen for the load.

Knot the rubber band on to the free end of the rope. Attach the pin or clip to the rubber band.

Notice that this block and tackle system has *two ropes* running through it.

Now lift the load by pulling down with pin attached to the rubber band. Lift the load as far as the system allows you.

While the band is still stretched, measure its length. Record the length in RESULTS.



Now set up the double pulleys. Begin by fixing the one pulley as shown in the diagram.

Then attach the rope to a bar or hook. String it around one wheel of the movable pulley and up around one wheel of the fixed pulley.

Bring the rope down around the second wheel of the movable pulley and then up around the second wheel of the fixed pulley.

Notice that this block and tackle system has *four ropes* running through it.

Now lift the load by pulling down with the pin. Lift the load as far as the system allows.

Measure the length of the stretched rubber band. Record the measurement in RESULTS.

RESULTS: Study the table below.

Measurement of the Stretched Band
Using the single pulleys with two ropes. _____ cm
Using the double pulleys with four ropes. _____ cm

The less the elastic was stretched the less force was needed to lift the load. In this investigation, when was the least force needed to lift the load?

_____

_____

_____

_____

_____

_____

_____

CONCLUSION: How is the force to lift a load effected by the number of ropes running through a block and tackle system?

Each rope in a block and tackle system supports some of the weight of the load. It is important to realize that only the ropes *between* the pulleys support the weight. With the single pulleys two ropes supported the load. With the double pulleys four ropes supported the weight of the load. When there are more ropes to support the weight, less force is needed by the person moving or lifting the load. The ropes have multiplied the force.

FOURTH DAY

The more ropes used in a block and tackle system, the less force is needed by the person using the system. Each rope supports some of the total weight of the load.

How much weight does each rope support?

If you are lifting a 200 kilogram load with a single pulley block and tackle, *two* ropes support the total 200 kilograms. Each rope supports 100 kilograms.

200 kg ÷ 2 ropes = 100 kg/rope

If you are lifting a 200 kilogram load with a double pulley block and tackle, *four* ropes support the total 200 kilograms. Each rope supports 50 kilograms.

200 kg ÷ 4 ropes = 50 kg/rope

If you lifted a 200 kilogram load with a block and tackle system that included *eight* ropes how much would each rope support? Show your work.

_____

_____

_____

_____

_____

The total weight of the load then, is divided evenly among the ropes used in the block and tackle system.

When using the block and tackle system, the ropes multiply or increase the force of the person using the system.

SEND FOR CORRECTION

How much is the force increased?

Imagine lifting a load with a single rope and a pulley system. You would use an imaginary force of one.

1 force × 1 rope = 1 force

Now imagine lifting that same load with a two rope block and tackle system. Since the two ropes support the load, the two ropes also multiply your force by 2. This means you need to use only $\frac{1}{2}$ as much force as you did when lifting the load without a pulley system.

$\frac{1}{2}$ as much force × 2 ropes = 1 force

If you lift the same load with a four rope system, the four ropes multiply your force by 4. This means that you need to use only $\frac{1}{4}$ as much force as you did when you used one rope.

$\frac{1}{4}$ as much force × 4 ropes = 1 force

The ropes increase or multiply whatever force you use to lift a load. Your force is multiplied by the same number as the number of ropes that there are in the block and tackle system.

Try the following. Check your answers with those given on page 13.

Six ropes in a block and tackle system are supporting a 900 kilogram load.

(a) How much weight is each rope supporting?

_____

(b) How much force must be applied to lift the load with a 6 rope system as compared to the force needed to lift the load with 1 rope?

_____

Complete the following.

A. Place a check mark beside the following statements which are correct.

1. The fewer the number of strings used, the greater must be the force applied.

2. The fewer the number of strings lifting the load, the more the force is multiplied.

3. The greater the number of strings lifting the load, the more the force is multiplied.

B. Circle the correct answer in the following.

1. When the number of strings lifting a load is decreased the load is

   a) lifted more easily. b) harder to lift.

2. When the number of strings lifting the same load is increased the force needed is

   a) less. b) greater.

3. To lift a greater load with the same amount of force, we would

   a) increase the number of strings. b) decrease the number of strings.

SEND FOR CORRECTION

C. A block and tackle system with eight ropes was being used to lift a 1000 kilogram load.

1. How much weight did each rope support?

_____

_____

_____

2. How much did the ropes multiply the force used to lift the load?

_____

_____

_____

3. How much force was needed to lift the load with eight ropes as compared to lifting it with one rope?

_____

_____

_____

Answers to pages 11 and 12

(a) 150 kilograms

(b) $\frac{1}{6}$ the force

FIFTH DAY

Health

Social Maturity and Good Manners

Good manners are a sign of

- consideration
- courtesy and respect.

Good manners give a person

- poise and
- self confidence.

Good manners are a part of your growth and development as a special person. When people say that you have good manners, they mean that you show kindness and consideration to others. Kindness and consideration of others are two basic rules in developing good manners. You can think of having good manners as something like playing a game because there are rules to follow. The rules are simple and easy to learn. Once you learn them, they stay with you forever. As good manners become a part of you, nice things happen to you. You have fun and people enjoy being with you, both at home and at school or wherever you go.

As you grow older and widen your circle of friends, you will find that it is desirable to know how to behave in different situations. Knowing what is courteous behavior in different social situations gives you poise and self-confidence. When you have the assurance that you know the correct social behavior you are not shy. This will give you greater confidence and you will make friends easily.

As a child you were taught to say "please" when you wanted something and "thank you" when someone did something for you or when you were presented with a gift. These two simple, courteous behaviors have stayed with you since your childhood days. You learned these two courteous behaviors by following rules and practicing the rules.

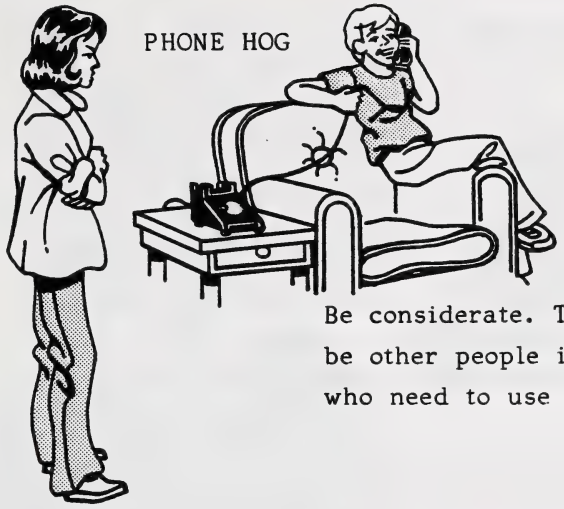
Here are a few other rules which will help you become a more courteous, poised, confident and happy person.

Telephone Manners

Answer the phone clearly and politely by saying, "Hello", or "Hello, this is the Travers' residence."

If your number is called by mistake say, "Sorry, you have the wrong number," and hang up quietly.

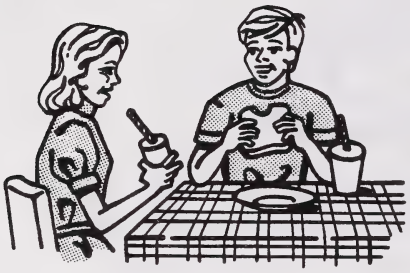
Do not be impatient and hang up the phone with a bang.



Be considerate. There may be other people in your home who need to use the phone.

ALWAYS WAIT YOUR TURN.
DON'T BE RUDE.

Table Manners



When you eat out in a restaurant or at your friend's place, do you feel as comfortable as you are in your own home? Are you self-sonscious and afraid that everyone is watching every move you make?

People often judge others by their table manners. Your home upbringing is reflected in your table manners so if you practice correct table manners at all times, you will be less self-conscious at mealtimes, and eating out will be a pleasant experience.

Here are a few rules which will put you at ease whether you are dining at home or at a special restaurant.

- Don't keep elbows on the table.
- Don't talk with your mouth full.
- Don't bolt your food.
- Remember "Please" and "Thank You".
- Be pleasant and cheerful. A pleasant enjoyable mealtime aids digestion.

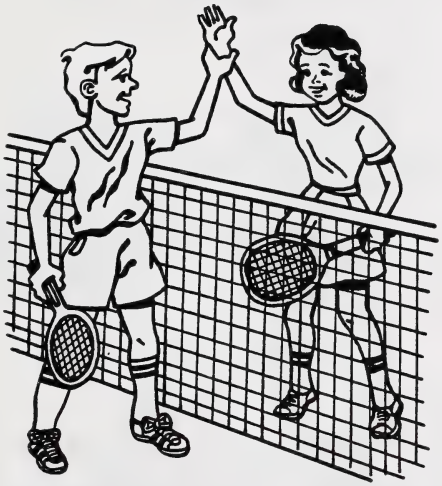
Manners in Public

Whether you are in school, at a downtown shopping mall, on a bus or on a train, you should behave in a mannerly way if you want to be liked and accepted by your friends. People who do not know you will observe your behavior and will judge you by your manners. In school or in any public place, it is best to obey rules such as:

- No running or pushing in hallways.
- No playing on escalators.
- Obey all traffic signals.

Disobeying these rules can be dangerous to you and to your friends as someone can be hurt seriously. Disobeying rules also shows that your haven't matured and that this kind of behavior is bad manners. Remember that loud, raucous behavior will not win friends for you.

On being a good sport



Play fairly.

Be pleasant when someone wins and be sure to say, "I am glad you won!"

You will be surprised with the number of friends you can win by behaving in a sports-man-like manner.

Don't be afraid to say, I am sorry. It will help to keep you out of trouble and it will show that you are a responsible person.

Having a sleep-over guest at your house.

One of the most important rules to remember before you invite a friend or guest to your house is to check with your mother whether it is agreeable with her that your friend spend several days at your home.

When your guest arrives he becomes your responsibility. This means that you are to entertain your friend. You should not expect your parents to entertain your guest.

If you share a room, make it clear where your guest may keep his things. Keep your things separate from his.

Give your guest the best things in the room. Always give your guest the first choice.

At meal times include everyone in the conversation.

Do not whisper or giggle together at the table when no one knows what you are giggling about.

These same rules would apply if you were a guest at a friend's house, but you should also remember to:

tidy your bed.

hang up your clothes.

offer to help your hostess.

thank your friend when you leave.

write a short thank-you note as soon as you arrive at home.

It is also important to write thank-you notes when you:

receive a gift.

receive an invitation to a party.

There are many other rules that you will learn and follow in the years to come. However, there is basically one important rule to remember and that is, "do unto others as you would have them do unto you".

When you learn to think of others as you think of yourself, and when you learn that everyone has the same feelings about himself as you have about yourself, it is a sign of maturity.

This ability to put yourself in someone else's place and to understand the way the person feels is called *empathy*.

When you have empathy for a person, you become more considerate and understanding. People enjoy you as a person.

Remember:

THE ONLY WAY TO HAVE A FRIEND IS TO BE ONE.

1. What do you consider good behavior? Why do you think a person should have good manners?

2. Have you ever witnessed any bad manners among your friends? Describe the incident. Tell how you would have behaved in a similar situation.

SEND FOR CORRECTION

3. Read through the following list of rules. Check the ones you follow faithfully.

- make my bed
- tidy my room
- do not monopolize the telephone
- do not monopolize the bathroom
- leave bathroom clean
- knock before entering a room if the door is closed
- take care of a younger brother or sister
- am kind and considerate to my mother, father, brothers and sisters especially when they're tired.
- listen to the advice given by grown-ups. (They have had a great many experiences and you can learn from them.)
- am cheerful

- Remember to send in your job list from Lesson 6.

SEND FOR CORRECTION

End of Lesson 8

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

_____
Signature

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Teacher's Comments:

_____
Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

FIRST DAY

In the last few lessons you have learned about simple machines. Examples of simple machines and what they do, is given below.

SIMPLE MACHINE	WHAT IT DOES
- lever	- multiplies force
- inclined plane	- multiplies force
- movable pulley	- multiplies force
- wheel and axle	- multiplies or increases speed
- fixed pulley	- changes the direction of the force

There are examples of these machines all around us. Read about two examples of inclined planes.

Read: *Concepts in Science 6*
Page 172 - the first five paragraphs only.

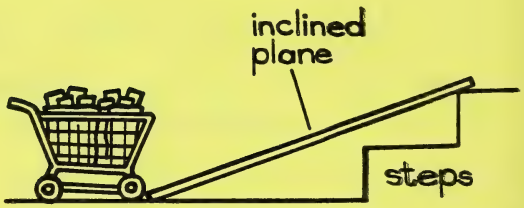
The inclined planes you read about are called *winding* inclined planes. Examples of winding inclined planes are winding ramps, and roads winding around hillsides or mountains. Like all inclined machines, winding inclined planes multiply force because they support some of the weight of the object being moved. A winding road up the side of a hill is an inclined plane which multiplies the force of a car going up the hill.

Not only do inclined planes multiply force, they can be used to multiply force by *different amounts*. The amount that force is multiplied depends on the *slope* of the inclined plane.

Study the following inclined planes to help you understand how force can be multiplied by different amounts.

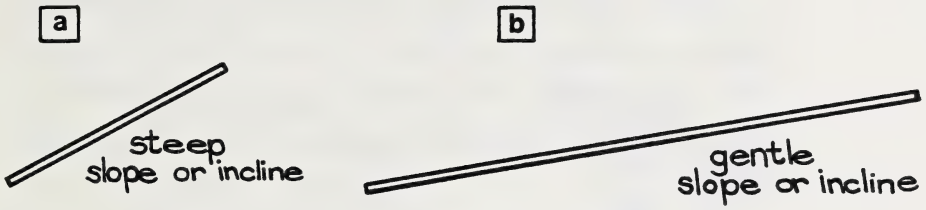
a

b



If someone were to use inclined plane a or b to move the groceries up the steps, the force would be multiplied by the inclined planes in both cases. The inclined planes would increase the force applied by the person pushing the groceries up. It would be less difficult for the person to move the groceries when using either inclined plane.

However, inclined plane b would increase or multiply the force more than inclined plane a. Why? Notice that in a the rise in height from sidewalk, over the inclined plane, to the top step occurs quickly. This is called a *steep* slope or incline. However in b the rise in height from sidewalk over the inclined plane, to the top step occurs more slowly or gently. This is called a *gentle* slope or incline.



Since the slope is gentle in [b] it takes less force to use this inclined plane. The inclined plane with a gentle slope multiplies the force more than the inclined plane with a steep slope.

> The gentler the slope on an inclined plane the more the force is multiplied.

Notice however that inclined plane [b] is longer than inclined plane [a]. When using inclined plane [b] less force is needed by the person, however a greater distance is travelled too. The person going up inclined plane [b] would travel further, but the force is multiplied much more than in [a].

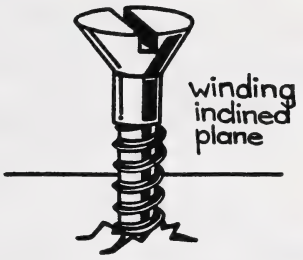
> The gentler the slope on an inclined plane the more the force is multiplied and the greater is the distance travelled.

This rule applies to both straight and winding inclined planes. Keeping these things in mind answer the following problems.

In lumbering areas roads are built for heavy duty trucks to reach the tops of hills or mountains. The shortest distance to the top would be straight up the side. Is that the best route? _____ Choose the road you would build from the diagram below. Tell why you would build this road.

Still another winding inclined plane is the screw.

Winding inclined planes all have the general shape of the screw. When referring to an inclined plane, people most often use the term screw.



How does the screw act like a simple machine? Complete the following to find out.

PROBLEM: How does the screw act like a simple machine?

MATERIALS: a piece of wood, a screw, a screwdriver

PROCEDURE: Turn the screw into a piece of wood with the screwdriver.

When the screw is about halfway into the wood, stop turning and try to push it in the rest of the way with the screwdriver.

RESULTS: Is it easier to push the screw straight in or is it easier to turn the screw into the wood.

_____

_____

_____

_____

Has the screw helped to increase the force of your wrist?

_____

CONCLUSION: The screw is a winding inclined plane, which acts like a simple machine. Tell how the screw acts like a simple machine.

_____

_____

_____

_____

_____

When the screw is *turned*, its point is pushed ahead with greater force than when the screw is just pushed in. By *turning* the screw in, the force of your wrist is multiplied. The screw, a winding inclined plane is a a simple machine which multiplies force.

Tell how a screwdriver could be used as a simple machine?

_____

_____

_____

_____

_____

_____

_____

_____

SEND FOR CORRECTION

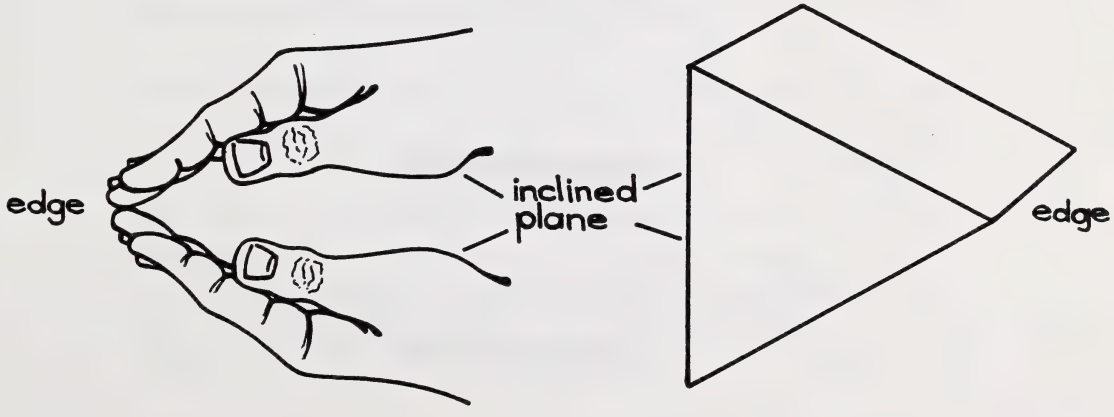
SECOND DAY

Last day you studied examples of simple machines which are all around us. Many people use these simple machines everyday. These simple machines are winding inclined planes. Examples of the winding inclined planes are the winding ramp, a winding road and the screw. These simple machines all multiply force.

Today you will continue to study examples of simple machines which can be found around us. Many people use these simple machines everyday, too. These simple machines all have *wedges*. Wedges are another form of inclined planes.

How are wedges formed? Wedges are formed when two inclined planes are put together as shown below.

A Wedge



The edges on inclined planes can be different shapes: straight, pointed or round.

Wedges with Straight Edges

chisel

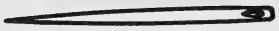
hatchet

jackknife

Wedges with Pointed Edges

nail

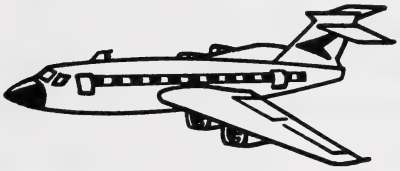
needle



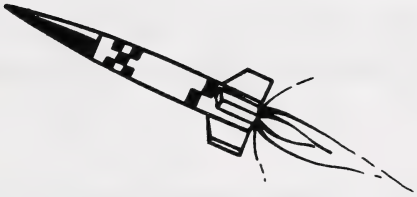
thumbtack

Round-Edged Wedge

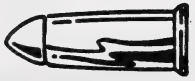
nose of an airplane



nose cone of a rocket



a bullet



Wedges are used to split or push through something. Think of a wedge that you have used to do some work. What work have you done with a wedge?

_____

_____

_____

Imagine trying to do that work without a wedge. Wedges help us do work that might be impossible if you used only your muscle. Why do you think a wedge is called a simple machine?

_____

_____

_____

_____

A wedge is called a simple machine because it multiplies force.

Last day you learned about a winding inclined plane called a screw. Often the screw and the round-edged wedge as a nail are confused.

Remember how the force is applied. With a round edged wedge like a nail, the force is applied straight and forward. However, with an inclined plane like a screw, the force rotates or turns the screw as it goes into the wood.

The screw and the nail can both be used to hold pieces of wood together. Is one better than the other for this purpose? Let's find out.

PROBLEM: Which holds better, a screw or a nail?

MATERIALS: 4 pieces of wood, a nail, hammer, wood screw and a screwdriver

PROCEDURE: Nail together two pieces of wood.

Screw together two pieces of wood.

Decide which took longer to do.

Try to pull the pieces of wood apart. Use the screwdriver as a wedge.

RESULTS: Which took longer to put in, the screw or the nail?

_____

_____

Which holds better, the screw or the nail?

_____

_____

Generally the screw takes longer to put in, and it holds better too.

SEND FOR CORRECTION

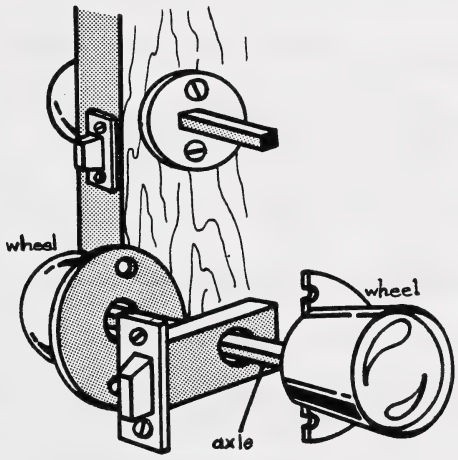
When might a person wish to use a nail instead of a screw? Why?

When might a person wish to use a screw instead of a nail? Why?

SEND FOR CORRECTION

THIRD DAY

You have been studying machines which are common everyday objects. A doorknob is a simple machine which you probably use many times a day. The doorknob is an example of the simple machine called a wheel and axle.



When you turn the wheel fixed to the axle, you increase or multiply your force greatly. The wheel and axle, then, is a simple machine that multiplies force when the force is applied to the wheel.

Still another example of a wheel and axle is the steering wheel of an automobile. It multiplies the driver's force so much that he can turn a car or a huge truck with little effort.

You also studied the wheel and axle on a bicycle. However this wheel and axle multiplied speed rather than force.

How is the bicycle wheel different? To answer this, think of *where* the force is applied on the doorknob system and on the bicycle.

Is the force applied to the wheel *or* to the axle of the doorknob system?

_____

_____

SEND FOR CORRECTION

What does this do to the axle?

_____

_____

Is the force applied to the wheel or axle of a bicycle?

_____

When the force is applied to the axle on a bicycle, what does this do to the wheel?

_____

_____

Choose from the following words to fill in the blanks. Use the words more than once.

wheel	axle

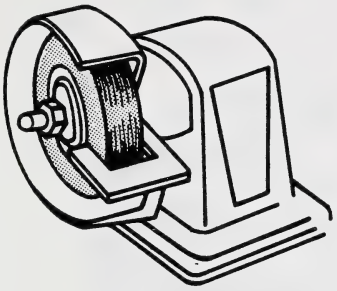
The bicycle and doorknob each have a wheel and axle system. However the bicycle and the doorknob are different because when the force is applied to the knob, which is really a kind of _____, the _____ is made to turn.

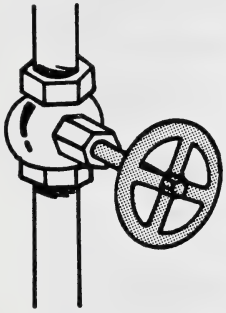
However, when the force is applied to the _____ on a bicycle, the _____ is made to turn.

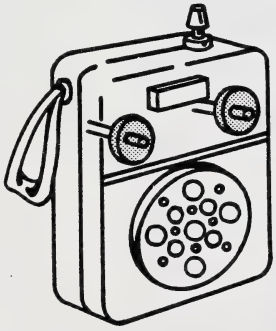
A wheel and axle can be used to multiply force or to increase speed depending on *where* the force is applied.

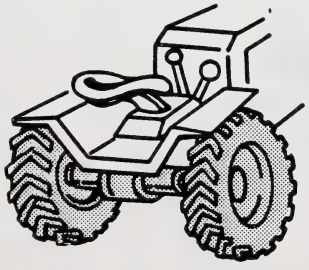
SEND FOR CORRECTION

Label the wheel and axle in each of the following. Tell whether you think the wheel and axle is used to multiply force or speed. Tell why you think as you do.



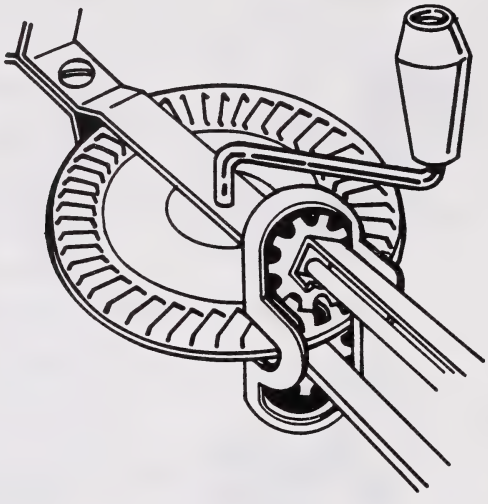




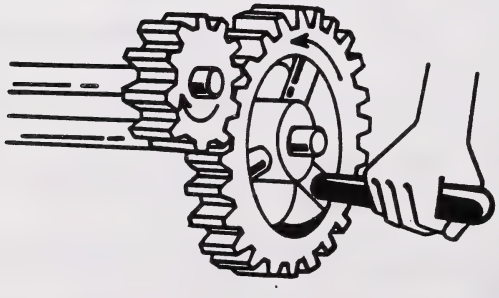


SEND FOR CORRECTION

A special form of the wheel and axle is called the *GEAR*. A gear is a toothed wheel like the kind found inside a watch or on a hand-operated egg-beater.



In the diagram below, the larger gear wheel has 24 teeth and the smaller gear wheel has 12. The teeth of the larger gear wheel fit into the teeth of the smaller gear wheel.



When the larger gear wheel is made to turn, the smaller gear wheel must turn as well. Since there are fewer teeth in the small gear wheel it must turn faster. How much faster? If the number of teeth in the large gear wheel (24) are compared to the number in the small gear wheel (12) a number called a *gear ratio* is obtained.

Work

Gear ratio $\frac{24}{12} = \left(\frac{2}{1}\right)$ $\left(\frac{24}{12} \div 12 = \frac{2}{1}\right)$

The number $\frac{2}{1}$ is the gear ratio. It tells us that there are 2 teeth in the larger gear wheel for every 1 tooth in the small gear wheel. This means that for each turn of the larger gear wheel, the smaller gear wheel must turn *two* times, so the smaller gear turns *twice* as fast. Knowing that the small gear wheel is made to move faster what do you think the gears can be used for?

_____

_____

_____

_____

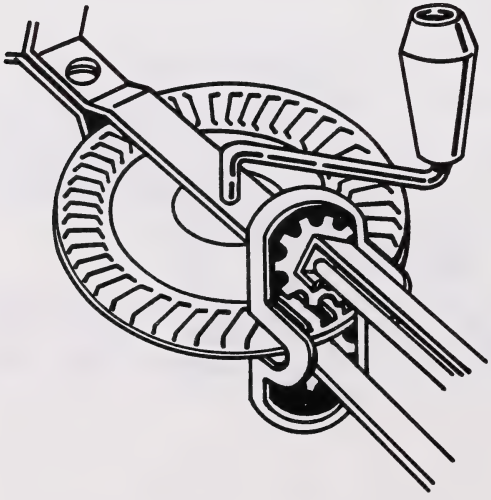
If you said the gears can be used to multiply speed you are right. The small gear wheel is attached to some object which will be made to turn faster.

In the following give the gear ratio and then tell how much faster the smaller gear wheel will turn than the larger gear wheel.

Large Gear	Small Gear	Gear Ratio	Times Faster
40 teeth	10 teeth	$\frac{4}{1}$ $\left(\frac{40}{10} \div \frac{10}{10} = \frac{4}{1}\right)$	4
56 teeth	28 teeth		
60 teeth	12 teeth		
100 teeth	10 teeth		

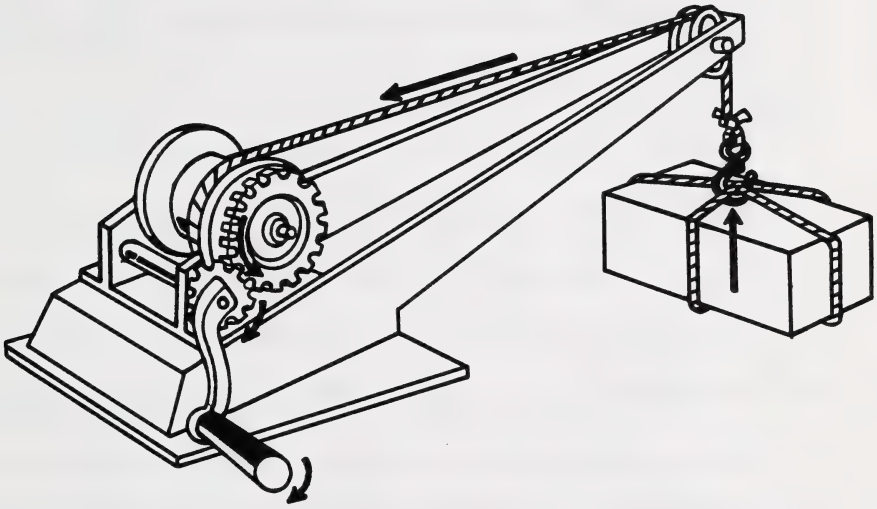
As the gear ratio increases what happens to the speed of the small wheel?

Did you notice that when gears are used to multiply force, the force is applied to the larger wheel.



SEND FOR CORRECTION

Gears can be used to multiply speed, but they can be used in other ways too. This diagram shows a hand-operated crane.



With the hand-operated crane, a force is applied to the smaller wheel, so that the larger wheel is able to lift a greater load. These two gears are used to multiply force.

Gears are a special kind of wheel and axle which can be used to multiply force or speed, depending on which wheel the force is applied.

In today's work you saw that sometimes force is applied to the large gear wheel to make the small gear wheel turn. Other times force is applied to the small gear wheel to make the large gear wheel turn. How do gears used in these ways remind you of a wheel and axle system?

_____

_____

_____

_____

_____

SEND FOR CORRECTION

FOURTH DAY

In this lesson you have been studying examples of simple machines which can be found around us. The chart below is a summary of the simple machines you have studied.

SIMPLE MACHINE	EXAMPLE	WHAT IT DOES
- LEVER	- any bar for raising or moving a weight at one end	- multiplies force
- INCLINED PLANES	- a ramp	- multiplies force
- special inclined plane called a winding inclined plane – more commonly called a SCREW	- a screw, winding ramp or road up a hill	- multiplies force
- WEDGE	- chisel, hatchet screw driver - round wedges such as nails, needles or bullets	- multiplies force and changes the direction of a force
- WHEEL AND AXLE	- bicycle - doorknob system - gears	- multiplies speed - multiplies force - multiply force and speed

In earlier lessons you studied:

- MOVABLE PULLEYS	- multiplies force
- FIXED PULLEYS	- changes direction of the force

Today you will study some compound machines. What do you think compound machines are?

_____

_____

_____

_____

Machines which are made up of more than one simple machine are called *COMPOUND MACHINES*. A pair of scissors is a compound machine. It has two levers fastened together at the fulcrum and the cutting edge on each of the blades is a wedge.

Still another compound machine is the meat grinder. The handle of a meat grinder is really part of a wheel and axle. If you have a meat grinder, look inside and you will find that the handle is attached to a kind of screw. The meat grinder, then, contains a wheel and axle that turns a screw.

If you have a jack, examine it to find how many simple machines it contains.

lever _____ inclined plane _____

pulley _____ wedge _____

wheel and axle _____ screw _____

A. Complete the following by circling the correct answer(s).

1. Two of the following which act like an inclined plane are a

   a) steep road. b) ramp. c) nutcracker.

2. One of the following contains a winding inclined plane. It is a

   a) hammer. b) meat grinder.

3. A wedge acts like

   a) a pulley. b) an inclined plane. c) a lever.

4. Two of these which have gears as part of them are

   a) bicycle b) an eggbeater

   c) a doorknob

B. Look around your house for objects, such as appliances, which you think might be using gears. Make a list of these objects below.

_____

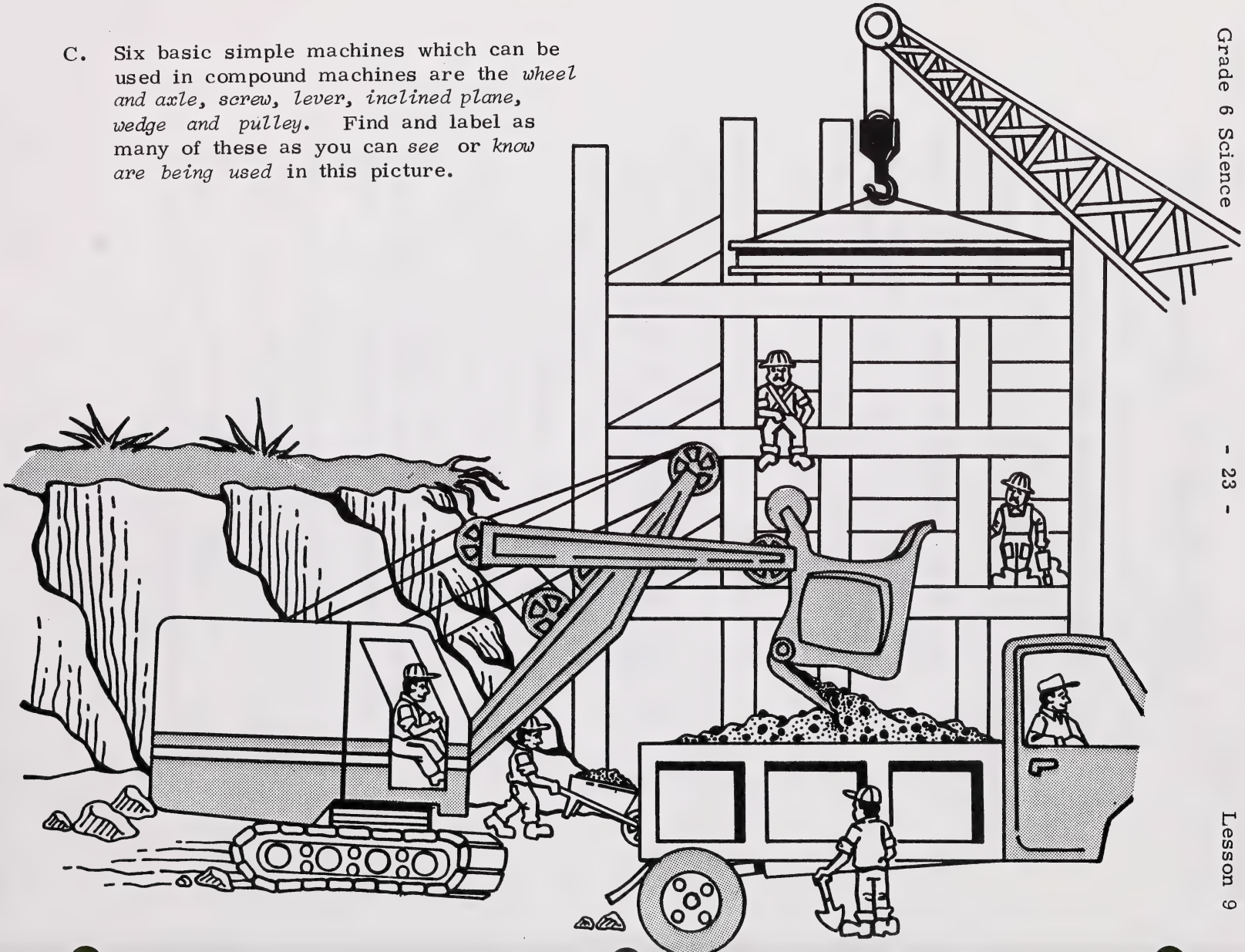
_____

_____

_____

SEND FOR CORRECTION

C. Six basic simple machines which can be used in compound machines are the *wheel and axle, screw, lever, inclined plane, wedge and pulley.* Find and label as many of these as you can *see* or *know are being used* in this picture.

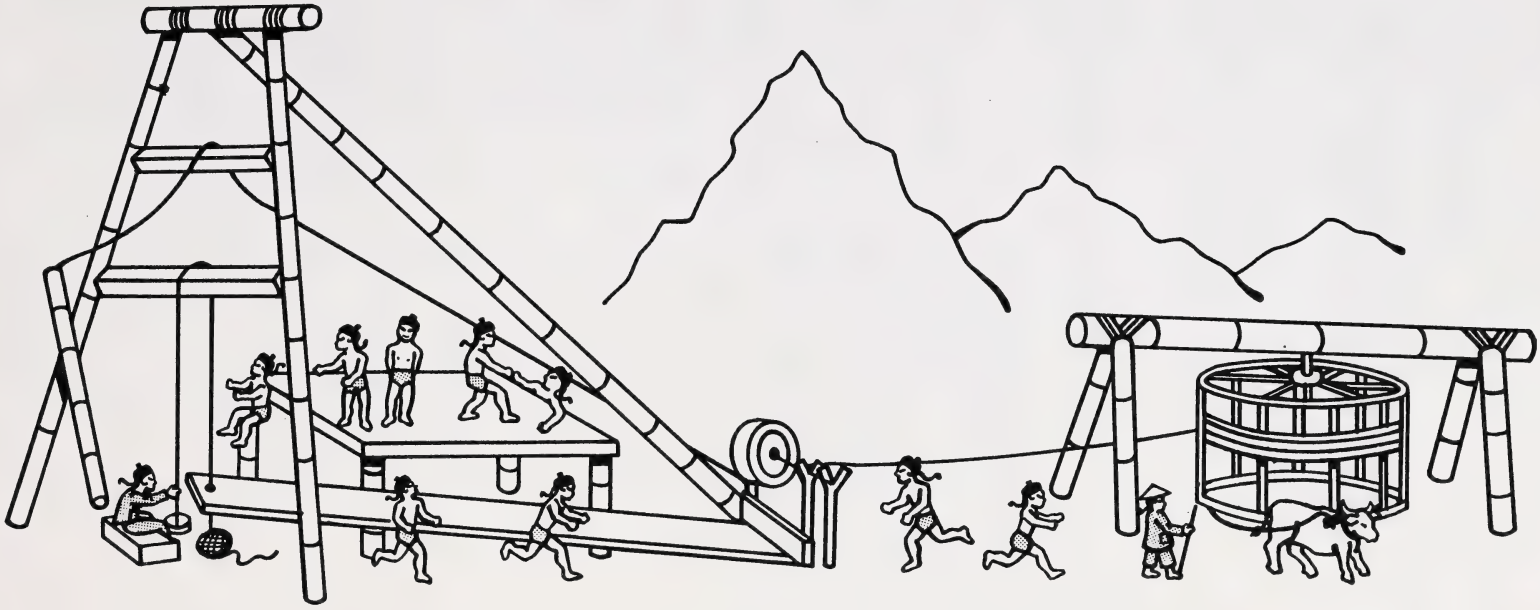


Even two thousand years ago simple machines were combined to make compound machines as the one shown below.

The cable rig idea is about two thousand years old! That long ago Chinese drillers made water wells, salt wells and even oil wells. The picture shows what one of these ancient rigs was like.

Look first of all at the long board attached to the rope that goes up over a roller and down into the well. Then look at the platform behind the board. Men jumped from this platform down onto the board. That jerked on the rope and pulled the drilling bit up in the well hole. When a man jumped off the board, the bit fell down and chipped away some rock. Round and round a whole crew of men raced, jumping onto the board and climbing back onto the platform as fast as they could. Still it took a long time to drill a well — sometimes as long as ten years.

Now look at the big wheel turned by a bull at the right. This wheel lifted the pipe made of hollow bamboo that you see at the left. The pipe was actually a bailer. Every once in a while the men poured water into the hole, let the bailer down and hauled up mud. Then the bit could go on drilling. Oil workers today still call the wheel which winds up cable "the bull wheel." PIPELINE MACHINES



FIFTH DAY

Health

What Decisions Do You Make?

A large part of your personal health depends on your actions as you grow and develop physically, mentally and socially in response to your interaction with people and the decisions you have to make.

What kind of decisions do you make? Do your parents encourage you to make decisions? Do you think it is important that you make decisions? Why? Discuss this with your parents.

Now read the following questions.
Check the answers that are right for you. Remember that there are no right or wrong answers.

	Yes	No
1. Do you decide what time you go to bed?		
2. Do you decide what time you get up each morning?		
3. Do you decide what clothes you are going to wear each day?		
4. Do you decide what clothes you are going to wear on the weekend?		
5. Do you decide what TV programs to watch between 4 and 8 o'clock?		
6. Do you think you should have an allowance each week?		
7. Do you decide the amount your allowance should be?		
8. Do you decide what you are going to buy with your own money?		

What two things do you usually buy?

_____

_____

SEND FOR CORRECTION

	Yes	No
9. Do you decide what books or magazines you are going to read for pleasure?		
What are your favorite kinds of books and magazines?		
mystery, comics, animal, serials, adventure, science fiction, history		
10. Do you decide when to begin your lessons each day?		
11. Do you decide when you should be helpful to your younger brothers or sisters?		

Describe an instance in which you chose to assist a younger family member.

Review the answers to the questions.

If you have answered yes to most of the questions, you are growing up socially and mentally. You are becoming a more responsible individual, and your parents recognize this fact. They are helping you grow up to make the right decisions and the right choices.

SEND FOR CORRECTION

In the last few weeks you have probably realized that regardless whether you are studying, attending a party, or playing with your friends, there are certain rules that you have to follow.

Your parents have probably set certain rules for you concerning meal time, helping around the home and completing your school work. All the rules have to be followed and obeyed in order that tasks are completed and your home life is harmonious and pleasant.

In the classroom, certain school rules such as arriving to classes on time, getting lesson assignments completed on time, paying attention to the teacher's instructions, co-operating with the teachers and students, these all must be followed if the students are to learn and the school is to function smoothly.

In the working world, as in the school world, plans are made for the day's work and certain tasks must be completed each day. Rules are made with regard to the working hours in a day. Rules are also set as to the length of the coffee and lunch breaks. It is important that workers get along with each other and carry their share of the responsibilities on the job, just as similar responsibilities are important among students in school.

Your preschool years and all your school years help to prepare you for your life as a responsible adult. These are some of the characteristics that your school years teach you.

1. perseverance
2. self-discipline
3. dependability
4. responsibility
5. neatness
6. courtesy
7. co-operation
8. empathy

Reread the questions concerning decision making on pages 25 and 26 today. Do you think the answers help to tell you what kind of person you are? Look at the different traits above that help to develop a person's character and check the traits you believe you have developed.

Another way to take a better look at yourself is to make an inventory of your interests, abilities, personality -- strong points, weak points, hobbies, achievements and future plans.

All About Me

Name _____

Age _____ Grade _____

Interests _____

_____

_____

Abilities
- things I do well
- things I like to do
- things others praise me for

_____

_____

_____

Personality - strong points

_____

_____

_____

- weak points

_____

_____

_____

Hobbies _____

_____

Achievements _____

_____

_____

Future Plans (after completing high school)

_____

_____

SEND FOR CORRECTION

Look over your inventory about yourself. Notice especially the section on abilities. Would you say that a person's abilities indicate the kind of life work a person will do? Let's suppose that a person is a good ball player. Would you say then that the person would choose to be a professional ball player? This is very likely, especially if the person's interests and abilities were closely related.

A. Circle the name of the occupation or work that would match each of these interests and abilities.

	Interests and Abilities	Occupations
1.	fishing and outdoor hiking	firefighter, park warden, farmer
2.	music - play the piano well, sing	editor, music teacher, dancer
3.	motorbikes - good understanding of machines	bike rider, service station attendant, mechanic
4.	children - communicates well with children, good story teller, empathy for children	bookkeeper, teacher, mechanic
5.	children, adults - makes people feel at ease, can provide comfort to young and old	teacher, nurse, salesclerk
6.	foods - excellent cook home decorating - makes any room look attractive and homey	salesman, homemaker, gardener

SEND FOR CORRECTION

B. List two possible occupations that you would choose as your life career or occupation. Your inventory should give you some clues as to the career you would choose.

_____

_____

_____

_____

SEND FOR CORRECTION

End of Lesson 9

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

_____

Signature

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Teacher's Comments:

_____

Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

FIRST DAY

In this lesson you will learn about friction. What is friction? What causes friction? Can friction be beneficial? Are there times when we don't want friction? These are some of the questions you will explore in this lesson.

Perhaps during the winter, you have seen people spinning their car wheels on ice, unable to get the car moving forward. Often people put sand under their tires in such situations. Then it seems the car will move ahead. The spinning stops. Why?

The sand keeps the car wheels from spinning on the ice. The sand helps produce *FRICTION*. What is friction?

> Friction is a force that resists motion.

Friction is a force that helps keep something from moving too freely.

What causes friction?

> Friction is caused by two surfaces rubbing against each other.

Some surfaces produce more friction or resistance to motion, than others.

> The amount of friction depends on the types of surfaces that are rubbing against each other.

What surfaces produce the most friction? To find out do the following investigation.

PROBLEM: To find which kind of surfaces produce the most friction

MATERIALS: elastic band, some sandpaper, some wax-paper, or aluminum foil, machine oil or cooking oil and two fairly large pieces of wood, or any 2 objects with a flat surface which can be pulled with the elastic band

PROCEDURE: Attach the elastic band to the wood or other object. With the elastic band pull the piece of wood, across the table.

When you use the elastic band to pull the wood, the band will stretch. Measure the length of the stretched elastic band. Record the measurement in RESULTS.

Place the second piece of wood on top of the first piece. Now pull the two pieces across the table. Measure the length of the stretch band and record the measurement in RESULTS.

Place some sheets of sandpaper on the table, with the rough surfaces up. With the elastic band pull one piece of wood across the sandpaper. You may have to hold one end of the paper down as you pull the wood across. Measure the stretched elastic band. Record the measurement in RESULTS.

Now, place some waxpaper or aluminum foil on the table. Spread some oil on the paper or foil. Pull the piece of wood across again. Measure the stretched band and record the measurement in RESULTS.

RESULTS:

Surface	Length of the Stretched Elastic Band
table	_____ cm
table - 2 pieces wood	_____ cm
sandpaper	_____ cm
oiled paper	_____ cm

There are two forces at work here. One force is the pull you applied to the wood. The other force is the friction or the resistance to movement caused by the different surfaces. The more the friction or resistance caused by the surface, the harder it is to pull the wood across the surface. The length of stretched elastic band tells you which surface produced the most friction or resistance to the movement of the wood.

Below are the surfaces on which you pulled the wood. Number these in order of least resistance - number one, to most resistance - number four.

_____ sandpaper

_____ oiled paper

_____ table and one block of wood

_____ table and two blocks of wood

SEND FOR CORRECTION

From the materials you used in your investigation, identify the following:

a rough surface _____

a smooth surface _____

surfaces pressed together lightly _____

_____

surfaces pressed together quite hard _____

_____

CONCLUSION: Which of the following surfaces produce the most friction or resistance to movement. Starting with 1, number them from most resistance to least resistance.

_____ a rough surface

_____ a smooth surface

_____ surfaces pressed together lightly

_____ surfaces pressed together harder

Surfaces which are rough and surfaces which are pressed together hard, produce more friction than surfaces which are smooth and surfaces pressed together lightly.

SEND FOR CORRECTION

SECOND DAY

Friction is a force which resists motion. It is caused by two surfaces rubbing against each other. Last day you found that the amount of friction produced depends on the types of surfaces rubbing together.

There are times when one wants more friction to help reduce some movement. One way to reduce movement is with a rough surface to provide force friction. When tire wheels slip on ice, sand is often thrown on the ice. Sand makes the ice surface rougher, and helps prevent the tires from useless movement.

Another way to increase friction is to increase the pressure on surfaces. Again winter drivers often load their car trunks with heavy objects. This extra weight increases the pressure on the icy roads and so increases friction. In these cases friction is useful and needed.

There are still more situations in which friction is useful. When there is friction there is energy. Energy is the ability to do work. The energy of friction can be transferred to objects, in the form of heat, light and sound energy.

Think of two surfaces which when rubbed together can produce heat.

_____

_____

Perhaps you thought of rubbing your hands together on a very cold day. Rubbing your hands together creates friction. The harder you rub, the more friction there is. The energy of friction is transferred as heat energy, which warms your hands.

Think of two surfaces which when rubbed together can produce light.

_____

_____

Did you think of matches? A match head has a rough surface. When the match head is rubbed against another rough surface such as the matchbox there is friction. The energy of friction is transferred to the match as heat energy. This is sufficient heat to ignite the chemicals in the matchhead. The burning chemicals result in light.

Think of two surfaces which when rubbed together can result in sound.

_____

_____

Drawing a bow across a violin creates friction. The energy of friction is transferred to the violin strings which vibrate producing sound.

Friction, then, can be very useful.

THIRD DAY

Last day you learned that friction can be very useful, in situations where motion must be reduced. Friction is useful in producing light, heat and sound energy, too. The friction you have learned about is called *sliding* friction. It is friction produced by two surfaces rubbing or sliding against each other.

Increasing friction is not always desirable. There are times when one wishes to decrease sliding friction. How can this friction be decreased? When would one want to decrease friction?

Perhaps you have had the experience of putting on your skates after the summer and finding you can hardly move on the ice because your skates are too dull and rough. You must take your skates to a skate sharpener where the blade is not only sharpened, but the rough surface is made smoother for easier gliding on the ice.

Using the above situation, tell of one way in which to reduce the sliding friction between surfaces.

_____

_____

_____

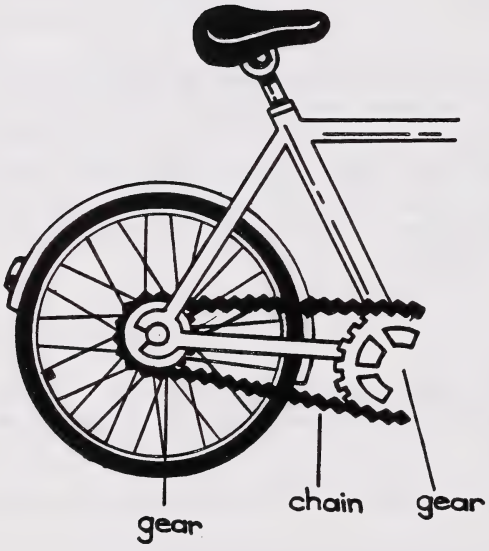
_____

_____

_____

There are instances when friction must be reduced. In simple and compound machines where moving parts rub against each other, the surfaces must be kept smooth to reduce friction. If there is too much friction, heat will be created. This heat will make the parts wear down and gradually even burn out or break.

For example: On your bicycle, the chain which rides over the gears can become worn if it does not ride easily and smoothly over the gears.



To decrease friction, the chain is oiled. This oil smoothes the surfaces on the gear and chain which come in contact. With less friction there is less heat. The chain and gears will not become worn out as quickly or easily.

What do you think might be the reason for a door hinge to squeak.

_____

_____

_____

_____

How can the squeaking be stopped?

_____

_____

_____

_____

_____

Why would this stop the squeaking?

_____

_____

_____

_____

_____

Most household appliances and home machinery require some oil for the moving parts in order to reduce the wear that friction can create.

SEND FOR CORRECTION

When pushing a cabinet or chest of drawers across a floor, it is easier to push when the contents of the cabinet or chest are removed. The reason it is easier to push is because there is less friction between the floor and cabinet when the cabinet is empty. On the lines below explain why there is less friction when the cabinet is empty.

Keeping the above situation in mind, tell of a way to reduce friction between surfaces.

Sliding friction, then, can be reduced by making the rubbing surfaces smooth. Friction can also be reduced by decreasing the pressure on surfaces which are rubbing together.

A second way to reduce friction, then, is to decrease the pressure between surfaces in contact. Your bicycle will serve as an example again. If the chain which rides over the gears is too tight, the pressure of the chain on the gears is increased. This increased pressure can create friction which will wear down the chain and gears. Lessening the pressure, by loosening the chain will help reduce friction and lessen the wear on the chain and gears.

SEND FOR CORRECTION

FOURTH DAY

The friction you have studied in the last few days is called *sliding friction.* Sliding friction can be useful for times when you want to slow down or stop movement. Sliding friction can be increased by increasing the pressure between surfaces. Example: loading a car with sand when driving on icy roads. Friction can also be increased by making rough surfaces rub together. Example: throwing sand under the tires of a car skidding on ice.

To decrease sliding friction the opposite effects must be produced. The surfaces in contact must be kept smooth. Example: oil applied to moving parts on your bicycle. Decreasing pressure on surfaces in contact is another way of reducing sliding friction. Example: removing the contents of a cabinet before sliding it across a floor.

There is still another way to decrease friction between surfaces. Do the following to discover a third way of reducing friction.

> Place an empty tin can upright on a table top. A juice can is fine. Give it a push. How far does it slide? Turn it on its side and push it again, so that it rolls across the table top.

Did the can move further when it was rolling or when standing upright?

_____

_____

_____

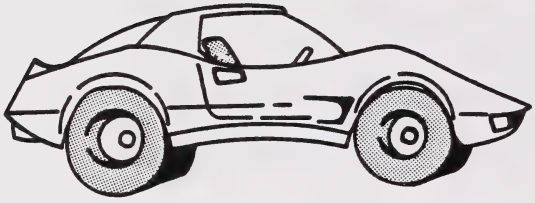
You probably found that the can moved further when rolling. This is an example of *rolling* friction. Rolling friction helps reduce friction between surfaces. Instead of two surfaces rubbing against each other, one or both surfaces are rolling.

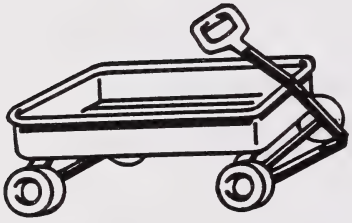
> In rolling friction there is less rubbing of two surfaces against each other. This means there is less friction.

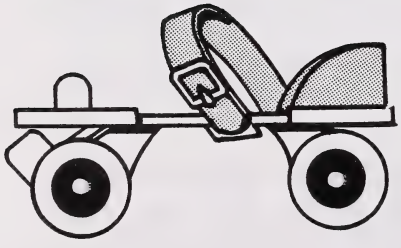
One of man's inventions takes advantage of a rolling surface to reduce friction. Can you think of what invention that might be? If you thought of the wheel you're right.

The wheels on a car *roll* along the road more than they rub against it.

Below are a few of the familiar uses of the wheel.

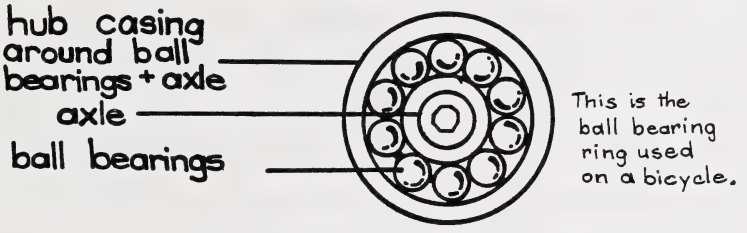


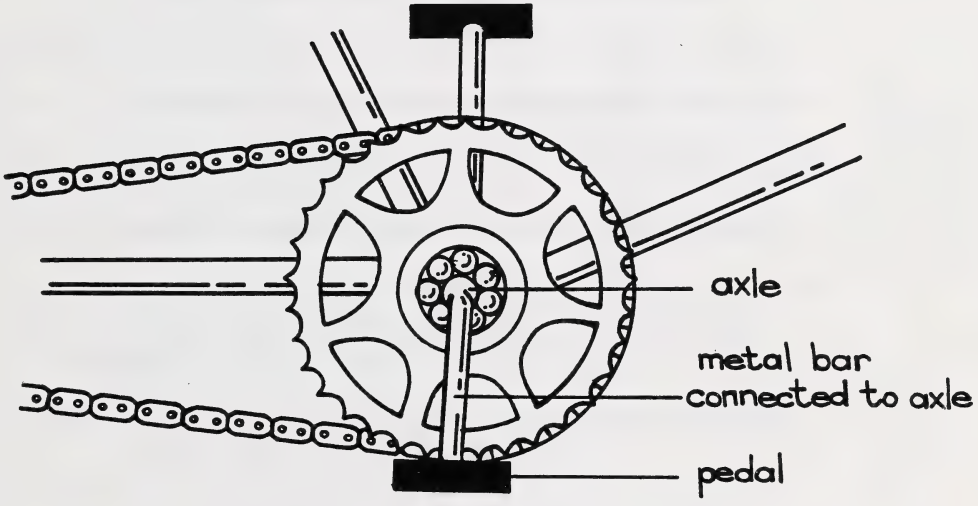




In each case the wheel acts as a rolling surface which reduces friction.

Another rolling surface which is most useful in appliances and machinery is the ball bearing. A ball bearing can be one metal ball or several metal balls contained loosely in a ring. See the picture below.





Notice that the pedal is connected to the axle by the long metal bar. When the pedal is moved by the cyclist, the axle is made to rotate which in turn moves the wheel. The axle rotates easily because of the ball bearings. The ball bearings, because of their roundness simply roll around as the axle rotates. They offer very little resistance to the rotating axle. When there is less resistance there is less friction created.

If the ball bearings were not there, the axle would come in direct contact with the casing or hub which normally surrounds the bearings and axle. As the axle rotated the casing and axle would rub together. The friction created would be so great, that the axle would just stop turning.

Does the use of ball bearings make any difference to how hard you have to pedal a bicycle? Give a reason for your answer.

Ball bearings help reduce friction created by the rotating axle. However, there is still the possibility of friction between the bearings themselves as they roll around. What could be used to decrease this friction?

I hope you said grease. Ball bearings are greased to help reduce the friction between the rolling bearings.

A. To review this week's work do the following.

1. In this lesson you have learned of two ways in which to increase friction between sliding surfaces. Name the two ways on the lines below.

_____

_____

_____

_____

2. Name three ways in which to decrease friction.

_____

_____

_____

_____

B. Complete the following by circling the correct answer.

1. Of the following two surfaces, the one which increases friction is a

a) wet road b) dry road

2. Of the two surfaces named below, the one which decreases friction is a

a) linoleum floor b) cement floor

3. Which of the three things listed below would reduce friction most on a dry road?

a) a sled b) a wagon c) a flat board

4. The friction produced by pulling a wooden box across a floor is greater when the box is

a) full b) empty

SEND FOR CORRECTION

C. Read the following and answer on the lines below.

Some colonists wanted to move some large logs. They had no wagons or animals. They had the large logs (which could be lifted only with great difficulty) and they also had some small logs.

Think of a way the large logs could be moved with the help of the small logs, if only for a short distance.

FIFTH DAY

Health

Goals and Careers

Have you ever thought about your plans for the future and what kind of work you would like to do?

Do you think that your choice of vocation will be influenced by the type of work your father or mother does? Or will your life work follow that of a favorite aunt, uncle or close friend?

When you were younger you probably imagined yourself as being a brave cowboy, a policeman, a teacher, nurse or even a doctor.

As you get older you will find that you tend to set your goals on a career that will best suit your needs. Your future job will probably depend on your interests, abilities, education and the style and quality of the kind of life you will want to lead.

Before you decide on the type of career you would like to follow, it is a good idea to research the different occupations that are available.

A good place to begin your research is at home. Take time now to interview your parents about their work. You may interview *either* your mother or your father. As you question your parents about their work write the answers on the following form.

On the blank indicate whether you interviewed your mother or father.

An Interview about my _____ work.

1. What is your job?

_____

_____

_____

2. What do you do at your job?

_____

_____

_____

3. What special skills are required to do your job?

_____

_____

_____

4. Do you work mostly indoors or out?

_____

_____

_____

5. Must you be physically strong to do this work?

_____

_____

_____

6. Is special training required? If so, what kind?

_____

_____

_____

7. Are there opportunities for advancement?

_____

_____

8. Are you happy in your work? Why?

_____

_____

_____

9. Would you like to have me do this type of work? Why or why not?

_____

_____

_____

_____

_____

10. Which subject areas that you studied in school are most important to your job?

_____

_____

_____

_____

_____

Discuss the interview and the answers with your parents.

Do not send the interview in for correction.

1. Write a statement or two telling whether your future career may or may not be influenced by the type of work your parents do. Tell why.

SEND FOR CORRECTION

Discuss the different vocations or work opportunities that are available in your community.

1. List the different vocations.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. Choose one of the occupations or vocations that you have listed above and research it. You can research it by doing an interview or by reading about it in newspapers, books, or watching TV. If possible, perhaps you can visit an office and observe the people at work. A newspaper office or a bakery would be good places to visit.

   Write a short account about the vocation or occupation you researched. Your report should include the title of the vocation, type of work, skills required, educational needs and future advancement.

   Vocation:

   _____

   _____

   _____

   _____

Type of Work:

Skills required:

Education:

Future Advancement

SEND FOR CORRECTION

3. Look through the Career Opportunities in your local newspaper. Select two job descriptions or job vacancies. Send them in with this lesson.

SEND FOR CORRECTION

4. Remember that a *goal* is an aim or purpose to achieve a desired result. You have probably set goals for yourself; for example, completing the Grade 6 studies by the end of June with an A average. Other students may set goals like improving their writing skills or reading skills. Still other students will set goals concerning their future vocations or careers. Here are other examples of goals which would influence a person's choice of career.

   Helping people - I want to help people without expecting much in return.

   Having leisure - I want a job that will give me plenty of time to enjoy hobbies, family and friends.

   Having power - I will be able to influence older people and have them do what I want.

   Making Money - I will earn enough to buy a large house, expensive car, and take extensive trips to far away places.

   Be Creative - I will have time to stay home and do my work. I will not make much money, but I will be happy in my work.

   Choose one of the above goals. Tell the kind of occupation or career you would have to choose to fulfill your goal. Tell what educational skills and educational background would be required.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SEND FOR CORRECTION

End of Lesson 10

LESSON RECORD FORM

0604 Science

Revised 90/04

Parent's or Supervisor's Comments:

For School Use Only

Assigned Teacher: _____

Assignment Code: _____

Graded by: _____

Lesson Grading

Science: _____

Health: _____

Neatness: _____

Date Lesson Received:

_____

Lesson Recorded: _____

_____
Signature

For Student Use

(If label is missing or incorrect)

File Number:

_____

Lesson Number: _____

Date Lesson Submitted:

_____

Apply Lesson Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and lesson.

Grading Scale:

A - Very Satisfactory
B - Satisfactory
C - Needs Attention
D - Unsatisfactory

Teacher's Comments:

_____
Signature

Keep this sheet when returned - it is your report.

Sc. 6-1-88

ALBERTA CORRESPONDENCE SCHOOL

MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS

1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:

(1) All pages are numbered and in order, and no paper clips or staples are used.
(2) All exercises are completed. If not, explain why.
(3) Your work has been re-read to ensure accuracy in spelling and lesson details.
(4) The Lesson Record Form is filled out and the correct lesson label is attached.
(5) This mailing sheet is placed on the lesson.

2. POSTAGE REGULATIONS

Do **not** enclose letters with lessons.

Send all letters in a separate envelope.

3. POSTAGE RATES

First Class

Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

Try to mail each lesson as soon as it has been completed.

When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.

FIRST DAY

Before completing today's work, review the notes in Lessons 5 and 6.

In Lesson 5 you learned that work involves *force* and *moving an object some distance*. The amount of work done depends on the amount of force used to move an object. The amount of work done also depends on the distance an object is moved.

In the following, decide when more work is being done. Explain your answer, on the lines provided.

1. A pencil is moved a distance of one metre.

   An armful of books is moved a distance of one metre.

2. A string of grocery carts is moved a distance of one block.

   The same string of grocery carts is moved a distance of three blocks.

SEND FOR CORRECTION

3. A stack of records is first moved from a table to a shelf. Then the same stack of records is moved the same distance from the shelf back to the table. However, the second time, the records are moved one at a time. Is more work being done during one of the moves? Why?

In Lesson 6 you learned about some simple machines: lever, inclined plane, wheel and axle, and the fixed pulley.

1. Give examples of how you could use each of these machines to help you do work.

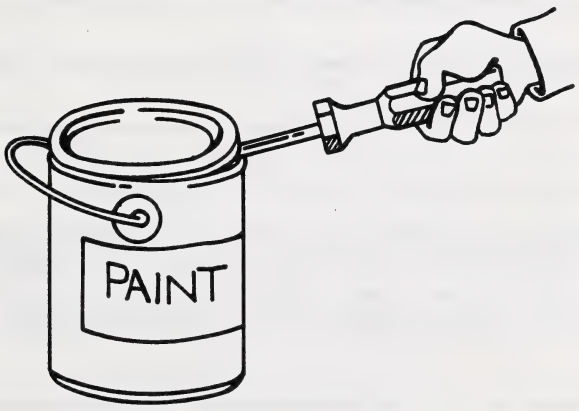
2. Then explain how each machine is helping you do work. Use the ideas of multiplying force, multiplying speed or changing the direction of a force, in your explanation.

SEND FOR CORRECTION

SECOND DAY

Today you will continue your review work. If you have Lesson 7 back from your teacher, you can review the notes now.

In Lesson 7, you studied the use of a lever. The lever is a simple machine that multiplies force. In the following diagram, label these parts: lever, fulcrum, force and load.



When using a lever, the position of the fulcrum is important. The fulcrum can be placed in three different positions. What are these three positions?

1. _____

_____

2. _____

_____

3. _____

_____

SEND FOR CORRECTION

Which of the three positions you listed is the best? Why?

In Lesson 8 you studied a block and tackle system which consists of a fixed pulley and a movable pulley. What is the advantage of having a movable pulley along with a fixed pulley in a block and tackle system?

With a fixed pulley and a movable pulley, the direction of a force can be changed and the force can be multiplied.

Some block and tackle systems use two ropes through the pulley wheels; others use four, six or more. How is the force that is required to lift a load affected by using a greater number of ropes in a block and tackle system? Why?

In a block and tackle system each rope between the pulley wheels supports an equal amount of the total weight. If six ropes are used to lift a 600 kilogram load, how much of the total load does each rope support?

THIRD DAY

In Lesson 9 you studied inclined planes in more depth. You learned that the amount of slope on an inclined plane is important when using the inclined plane to multiply force.

Complete the following by filling in the blanks with the correct word.

An inclined plane with a _____ slope
(gentle, steep)

multiplies force more than when using a

_____ slope. However when using an
(gentle, steep)

inclined plane with a gentle slope, the distance

travelled is usually _____ than the
(greater, less)

distance travelled when using a steep slope.

In addition to the straight inclined plane, you studied the winding inclined plane which also multiplies force.

Give 3 examples of winding inclined planes around you.

_____

_____

_____

_____

_____

How does the amount of slope on a winding inclined plane effect the multiplication of force and the distance travelled?

Still another simple machine which makes use of inclined planes is the wedge. The wedge, as a simple machine, multiplies force.

How is a wedge formed?

Name three wedges. Give an example of the work for which each wedge can be used.

A wheel and axle is another simple machine. A wheel and axle can be used to multiply force or to increase speed. It all depends on where the force is applied.

Complete the following by filling in the blanks with the correct word.

If you wish to use the wheel and axle to multiply force, the force should be applied to the _____ .
(wheel, axle)

An example of a wheel and axle being used to multiply force is:

_____

_____

_____

_____

To use the wheel and axle to multiply speed, the force should be applied to the _____ .
(wheel, axle)

An example of a wheel and axle being used to multiply speed is:

_____

_____

_____

_____

FOURTH DAY

Today you will review your work from Lesson 10.

A. Complete the following.

1. What is friction as the word is used in science?

_____

_____

_____

_____

_____

2. What causes sliding friction?

_____

_____

_____

_____

_____

3. What kind of surfaces tend to cause the most friction or resistance to movement?

_____

_____

_____

_____

_____

SEND FOR CORRECTION

4. Friction can be useful. Give at least four examples of ways in which friction is useful.

SEND FOR CORRECTION

5. Sliding friction can be reduced in at least three ways. What are the three ways?

6. Give an example of how you could use each method of reducing sliding friction. Think of examples other than those given in your notes.

SEND FOR CORRECTION

FIFTH DAY

Health

Review

This week's health lesson is a review of the health exercises presented in the first eleven lessons. You may choose to read through the health lessons before you begin today's exercises.

1. On the blanks provided write **T** for each sentence that is true and **F** for each sentence that is false.

_____ (a) A person with good mental health is able to communicate freely with his peers and with adults.

_____ (b) A person with good mental health does not need help or guidance from other people.

_____ (c) A person with good mental health is happy all the time.

_____ (d) A person develops physically, emotionally and socially at the same rate.

_____ (e) Emotion is a departure from the usual calm state to a strong feeling of fear, anger, hate.

_____ (f) Some characteristics of good mental health are hate, joy, greed, selfishness, thoughtlessness and a feeling of being responsible.

_____ (g) Trying to get revenge is one way to handle anger.

_____ (h) If you have any problems or difficulties, it is a good idea to discuss the problems and anxieties with an understanding adult.

SEND FOR CORRECTION

_____ (i) A true friend is someone who is kind, helpful, concerned about you, and someone you can trust.

_____ (j) Failure to keep one's promise is always inexcusable, no matter what the circumstances.

2. Write the word that fits the following definitions. Choose from the words given in this list.

dependable	commitments
social maturity	postponing
co-operation	goals
alibis	career
empathy	good manners

(a) Promises to do something are called

_____.

(b) When you put off doing something for the pleasure and satisfaction later on, you are

_____ a satisfaction.

(c) The ability to understand how someone else feels is called _____.

(d) When you make excuses you are making

_____.

(e) A person who can be relied to keep promises is

_____.

(f) Working <u>together</u> to accomplish something is

_____.

SEND FOR CORRECTION

(g) Ability to handle emotional problems in a positive way is a sign of _____.

(h) Courtesy, consideration, respect, poise, and self confidence are a sign of _____.

3. Make a list of 5 good manners that you practice all the time.

_____

_____

_____

_____

_____

_____

_____

_____

4. Tell something that you did that makes you feel good about yourself.

_____

_____

_____

_____

_____

_____

_____

_____

5. The other day I told Mary that I liked the dress she was wearing. I told her that the color of the dress was very pleasing on her and that the dress showed up her lovely figure. Mary smiled and seemed very pleased. My comment made her feel good. She knew that I cared how she looked.

   Tell something that you did to show that your cared about a member of your family.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

6. Tell about something that you observed someone doing to show that they cared about someone else.

_____

_____

_____

_____

_____

_____

_____

_____

7. Name the jobs and chores you do at home.

_____

_____

_____

_____

_____

8. Name jobs outside the home that are similar and require the same skills.

_____

_____

_____

_____

_____

9. What do you like about these jobs?

_____

_____

_____

_____

_____

10. What don't you like about these jobs?

_____

_____

_____

_____

_____

SEND FOR CORRECTION

11. What other jobs would you rather do?

_____

_____

_____

_____

_____

12. Pretend that you are going to apply for a summer job at the local restaurant.

Complete this application form.

Name _____ Grade _____

Address _____

_____

Telephone Number _____

Birthplace _____

_____

Birthdate _____

Person to notify in case of an emergency.

_____

_____

Qualifications; skills

_____

_____

_____

_____

_____

_____

_____

SEND FOR CORRECTION

Personal Interests, hobbies etc -

_____

_____

_____

_____

Type of work you would like to do.

_____

_____

_____

Previous Job Experience

_____

_____

_____

_____

_____

_____

_____

Signature _____

SEND FOR CORRECTION

End of Lesson 11

N.L.C. - B.N.C.
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